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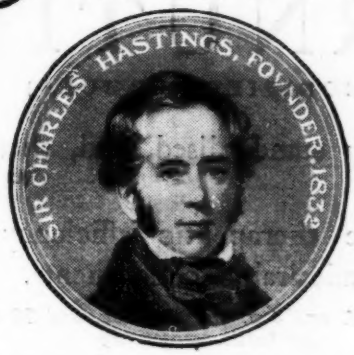

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An Address

ON

THE STUDY OF NATURE AS SHEDDING LIGHT ON THE STRUCTURE AND FUNCTIONS OF MAN.

THE ANTLER OF THE DEER AND ITS RELATION TO THE GROWTH OF BONE.

DELIVERED AT THE SIXTH MEETING OF THE INTERNATIONAL SOCIETY OF SURGERY.

BY

SIR WILLIAM MACEWEN, M.D., F.R.S.,

REGIUS PROFESSOR OF SURGERY IN THE UNIVERSITY OF GLASGOW, PRESIDENT OF THE SOCIETY AND OF THE BRITISH MEDICAL ASSOCIATION.

In the name of the British Section of the International Society of Surgery and its local committee it is my privilege to extend to our international colleagues a very hearty welcome. We are not unmindful of the courtesy, kindness, and hospitality with which the British members have invariably been received in the countries where the Congress has already met—three times in Belgium, once in the United States of America, and once in France. It will be the endeavour of the British Section to make our colleagues from beyond the seas feel "at home" in our midst, on this the first meeting of the International Surgical Society in Britain.

One of the tragedies of the war was the disruption of intellectual co-operation beween the contending peoples. The work done in one country is often complementary to that done in others, and the collaboration of the scientific workers of all nations forms a powerful stimulus to the spread of enlightenment throughout the world. It is for the general good that endeavour be made to resuscitate and sustain the intellectual life of Europe by international co-operation, especially in the ever-active and boundless realms of science.

In a recent address given by me the question was raised whether the medical profession did not concentrate their studies too much on human phenomena to the exclusion of life as a whole. "The so-called divisions of Nature are purely arbitrary conveniences, having no existence except in our own minds, for, after all, we are but a bit of Nature, and everything pertaining thereto must have a bearing on humanity." Investigation into comparative anatomy and physiology tends to illuminate the obscure problems of growth of structure and function in man, and, as an illustration of this in one small field, attention is directed to some of the phenomena attending the growth and shedding of the antler of the deer, especially in its histological aspects, and the bearing which these have upon the growth of bone in man and other mammalia.

The male deer produce annually, within the period of three months, antlers of solid bone, which in some species grow to immense size. They carry these antlers for a few months, then shed them, and repeat the process every season. The antlers are branched outgrowths from the frontal bones of the skull, and are amongst the most remarkable and interesting instances of sexual dimorphism. The yearly recrescence takes place chiefly from June to August. Not only does the bone grow within these few months, but the whole antler is enveloped from base to tip by the velvet, which keeps pace with the rapid growth.

The Velvet: its Function.

There is very little inosculation between the vessels of the velvet and those of the bone in the antler. Besides supplying through its blood vessels heat and moisture and giving general protection as a cuticular covering and limiting membrane, the highly sensitive velvet serves at least two purposes, one to the antler itself and one to the animal as a whole. It protects the soft pulpy growing antler by causing the animal to eschew issues of combat and violent or even slight contact with foreign bodies. In this way wounds of the antler with their attendant haemorrhage and risk of septic or pyogenic infection are prevented. Were it not so protected the pulpy antler might be burst, ruptured, or torn, and, being highly vascular, so much blood might be lost as to endanger the life of the animal.

When the osseous matter in the antler has solidified there is no further need for this covering, which has already served its purpose. The growth of the bone at the corona compresses the blood vessels of the velvet and cuts off their blood supply, when the whole velvet withers, becomes dry and shrivelled, is cast off in ribbons or is stripped like a discarded glove. The solid antler now remains—a formidable, insensitive weapon.

What is the Cause of the Annual Shedding of the Antler?

As one of the secondary sexual characters, the antler is usually described as merely an ornamental weapon. It is, however, more intimately correlated to the sexual function. Though the reproductive organs with their interstitial tissue are the *fons et origo* of the antlers, the antlers, through the velvet, have a periodic reflex influence on the function of the testes. The phase of evolution and greatest sensitivity of the velvet corresponds to the period of minimal testicular activity as if a reflex inhibitive influence was exercised on the testes through the nerves of the velvet.

When the antler has become well formed and sclerosed, the nerves and blood vessels are obliterated, and the velvet is shed. At this period the bloodless, nerveless, insensitive structure is left as a weapon fit for combat. If, however, the velvet is to serve the retardative function over the reproductive organs, then it must be shed annually and grow afresh. The sensitivity of the antler at that early stage is thus probably purposive and is one reason for the antler being deciduous.

Two Points regarding the Structure of the Velvet:

(1) The stratum lucidum—has it an independent vitality?

(2) The cutis of the velvet grows directly on the bone.

With regard to the structure of the velvet, with its complete cutaneous investment containing glands, hair follicles, and appendages, which are evolved with the rapidity and completeness of an embryonic structure, there are two points worthy of note from their bearing on surgical pathology.

First, the stratum lucidum is more advanced in development during the growing period than the stratum Malpighii, the former appearing mature when the latter is still embryonic; osseous tissue is first rapidly covered by stratum lucidum, the stratum Malpighii following. This corresponds with what is found in wounds, where the stratum lucidum penetrates blood clot and advances almost *pari passu* with the leucocytes, ahead of the stratum Malpighii, or on granulation surfaces where the stratum lucidum precedes the Malpighii, forming the "dry, red line" seen at the margin of a healing ulcer.

May not the question be raised whether the current view be correct—that all the layers of the skin grow from the stratum Malpighii upwards, and that the superficial layers, including the lucidum, are in process of being cast off as more or less effete? Would effete cells be the first to regenerate?

The evidence adduced tends to indicate that the stratum lucidum possesses an independent vitality and is endowed with the power of more rapid surface extension than the deeper layer. This also obtains when the stratum lucidum is detached from the body and is grafted on to a granulation surface. It is of importance to have this layer of stratum lucidum, thin as it is, covering a wound, as it forms a living barrier to the ingress of germs, and, once formed, the proliferation of the slower stratum Malpighii and the organization of the tissues inside the wound proceed apace. The deep cutaneous layers, however, provide a thicker covering for the wound and protect the interior from friction and injury.

The second point is that in the antler one sees the cutis

of the velvet growing directly on the bone without any intervening membrane (periosteum), the cells of the cutis resting on the osseous tissue contiguous the one with the other. The cutis is sessile on the bone. Analogies may be found in the human body under pathological conditions. It may be seen in exposed bone, in compound fractures of the tibia, with loss of soft tissues. The skin may then grow directly over the embryonic osseous tissue in the course of its formation, and, becoming rigidly attached, form an adherent cicatrix. The same may occur after amputations which have healed by granulation tissue, the skin becoming fixed to the osseous tissue, much to the detriment of the patient.

When an amputation has been performed in childhood through an arm or thigh, in the course of years, if the soft tissues are allowed to contract from disuse atrophy while the bone continues to grow, a conical stump may result. The bone gradually protruding through the soft tissues is covered only by a thin, stretched layer of cutis—chiefly stratum lucidum. Like the velvet in the antler the human skin tries to keep pace in covering the growing bone in its protrusion, but, unlike the velvet, it only succeeds in covering it by such a thin layer of closely adhering skin that it is liable to injury on slight occasion.

The Methods of Growth of the Antler—Analogous to Diaphyseal Bone.

The frontal bone from which the antler springs is not the usual site of diaphyseal bone. The frontal is only covered by pericranium, to which even the "Orthodox School" does not assign osteogenic powers of a high order. The method, however, by which the stag's antler grows from the pedicle, though not identical, is somewhat analogous to the growth of a diaphyseal bone, emanating from a single epiphysis, there being no distal apposition or impediment to its growth. Notwithstanding the myriad of cells so rapidly produced within there is no jumbling or overcrowding, each one forms and takes its proper place according to hereditary behest.

Protoplasm is not a single homogeneous substance. It is complex, each particle holding fast through countless generations to its own particular type. The cell also is not merely the expression of a chemico-physical basis of life, but every particle of living protoplasm within it has a long hereditary history fixed in the structure of each of its various molecules. So that, in the swarming millions of cells within the antler, each one follows by hereditary law its ordered sequence.

Metchnikoff's Belief as to Cause of Old Age and Death in Cells of Body Generally.

Metchnikoff believed that in the body generally old age is not brought about simply from the arrest of the reproductive power of the cells, but that the cells of the body grow old on account of the impairment of the phagocytes and the invasion of the body by germs introduced through the large intestine. In this way senescence, decay, and death occurred.

The Method of Death of the Cells of the Antler.

In the deciduous stag's antler none of these factors obtain. The whole evolution, ultimate sclerosis, death, and separation of the antler is aseptic, and phagocytosis plays no part therein. The death of the bone is primarily due to increased osteoblastic formation encroaching centripetally on the lumen of the vessels, resulting in sclerosis of bone, and finally in ischaemic death. The osteoblasts extract from the blood the ossein, which they deposit in their periphery and build themselves in, cut off their food supply, and become entombed.

There is no senescence in the cells of the antler—they all die young. The mature period of osteoblastic formation is just reached and the completed bone cells formed when they, while still in the full vigour of youth, perish by their own reproduction. For them there has been no senility and no decay. They have built up a beautiful structure, and when they perish they leave behind a nerveless, bloodless, hard, dense bone as a weapon of offence and defence, which can bear without sensation the blows of adversaries.

Why does the Osteoblast not Continue to Grow in the Antler Indefinitely?

There is no physical obstacle to an upward expansion of the antler. The rejuvenation of the cells of the antler depending on the increase of nuclear material is abundantly evidenced in nuclear budding, and even in the possible formation of new cells produced by the shedding of nuclear buds, surrounded by a layer of cytoplasm—daughter cells—an extra method of cell production augmenting the ordinary cell division.

Though contrary to recognized methods of cell proliferation, the phenomena of nuclear budding and the possible production of daughter cells is suggestive of a supplemental mode of cell production. Such would aid in the rapidity of cell formation and in the rejuvenation of the cells exhausted by constant segmentation and requiring to make still further effort to multiply at a point so far removed from their base—the pedicle.

The nuclear budding and the formation of daughter cells — formed and thrown off — may mark the commencement of a new cycle in cellular proliferation (being physiologically comparable to the period of sexual maturity in multicellular organisms); in this way senescence in the cells is warded off and rejuvenescence is maintained.

The Growth of the Osteoblasts outside of the Bone such as takes place after Fracture.

In the outpouring of osteoblasts in the repair of bone bereft of its periosteum, such as in fracture, the same question arises in an intensified form, as the osteoblasts are then outside of their own direct nerve control. Why do the regenerating cells which have been actively proliferating know when to stop their reproduction? Why don't they go on producing indefinitely? Here heredity cannot play the same dominating rôle, as the factors are so variable and accidental circumstances are introduced which the osteoblasts must overcome. There must be conditions governing the product of the outpouring beyond the influence of the trophic nerves of the bone—which, however, may still have a "wireless" control of the osteoblasts, or which may have a limited, independent life within the living tissue.

It is observed that as long as the osteoblasts which have thus been poured out can be kept in their germinal state fixation by ossein and consolidation is warded off and reproduction of cells is continued. Constant movement of the parts is conducive to large outpourings of cells, which are prone to take on the cartilaginous formation and fixation is delayed. An abundant supply of thin-walled blood vessels greatly facilitates the deposition of ossein and so encourages fixation.

Reference may be made to the case of a seaman who got his thigh bone broken in its upper third aboard a vessel wrecked in the Bristol Channel. He was tied to a spar, and, being washed overboard, got stranded on a rock, his damaged leg swinging to and fro in the waves for forty-eight hours. He was afterwards rescued and lay in hospital for many months. As a result of the constant movement to which his leg had been subjected by the waves, a great tumour-like mass of bone formed in the thigh in the midst of the torn and lacerated muscles; for the relief of this he was ultimately sent to me. So great was the development of new bone that an extensive "quarrying" with chisel and mallet was required before the normal shaft was exposed and alignment could be effected. After operation rapid healing took place with only an inch of shortening.

The Mature Osteoblast—A Typical Form of Cell.

A definite form or type of cell is recognized in the mature osteoblast of the antler. This is contrary to the opinion held regarding the mammalian osteoblast in general, which is said to be only definable by function and not by any special histological character.

When this cell was first seen by me in sections, from the growing antler, it seemed so distinctive as to appear *sui generis* to the antler itself. Many sections from various parts of the antler were subsequently studied to investigate the origin of the osteoblast and to trace it through its evolutionary stage from the germinal layer until it assumed its mature form.

Once the osteoblast assumes its mature form it becomes distinctive and the cell may be easily recognized and traced through its further evolution into bone. The typical form of the mature osteoblast is an ovoid cell with its nucleus situated peripherally and occupying its narrow end. In the antler one sees the mature osteoblast in great numbers all along the growing line. They are in such quantities that in many places they are obtrusively evident; though coincident with or in immediate sequence to attaining maturity, however, the osteoblast assumes the function of abstraction from the blood and deposition of ossein within a circumscribed area round itself. This forms a fuliginous veil of ossein quickly obscuring the cells and rendering the tissue opaque.

After recognizing this mature form of osteoblast in the antler of the deer, sections of growing bone from other animals were re-examined and were found to exhibit the same typical form of mature osteoblast, though they were not present in such numbers as in the antler. Thus they were seen in the growing epiphyses and in repair of bone in man, especially in children and in young adolescents, and in the growing epiphyses of the dog and other animals. The sections taken from bone growth in glass tubes also show the type of mature osteoblast somewhat similar to that seen in the antler. They may also be seen in bone growing in a cicatrix in the midst of the abdominal muscles—being carried there by the blood stream.

Two Forms of Ossification Found in the Antler at the Same Time.

This mature type of osteoblast may be recognized and followed through both forms of bone formation—the direct or membranous and the indirect or cartilaginous—though in the former it is more difficult to discern, as the ossein is deposited more quickly, thereby producing obscuration followed by rapid osseous fixation. These two forms of ossification are found in the same antler at the same time, and each proceeds through the same base, which is cartilaginous—a primary cartilaginous evolution.

In the human epiphyseal cartilage one finds two distinctive forms of osteoblasts placed back to back and contiguous to each other—the one destined to form epiphyseal cancellous tissue, the other dense diaphyseal bone.

The difference between the method of ossification in the antler and that of the mammalian epiphyses is that in the latter there are, in the epiphyseal plate, two layers distinct from each other — the one composed of diaphyseal cartilage, the other of epiphyseal cartilage. They go in different directions — the one toward the joint, the other away from it; whereas in the antler both forms of ossification pass through a common cartilaginous base, and after doing so the emerging cells become differentiated, the membranous ossification showing itself especially toward the distal aspects of the tines.

Bone Only Grows from an Osteoblast: the Osteoblast Breeds True to Specific Type of Bone.

It is held and taught by some histologists that all forms of mesoblastic tissue are intraconvertible—that a primitive connective tissue cell may develop into perfect fibrous tissue at one time, or into aponeurosis, cartilage, or bone at another—a kind of indifferent tissue capable of transforming itself as occasion requires.

From my observation there is no evidence of the existence of such an indifferent or elusive tissue, and none of an osteoblast being converted or being convertible into fibrous tissue. Periosteum never produced, nor is it capable of producing, a single osteoblast. The bone cell is derived from tissue which is primarily osteoblastic and which produces nothing other than osteoblasts. Not only so, but besides being generically bone cells, the osteoblasts are produced according to the specialized type of bone to which they belong. A diaphyseal osteoblast produces diaphyseal tissue, and an epiphyseal osteoblast always epiphyseal tissue. The osteoblast breeds true to its specific type.

In the canine species it would be as natural to expect that there existed a generic canine cell, which was so indifferent to specialization that it could develop into a fox-terrier or into a sheep-dog as chance or caprice might direct, as to believe that a single bone cell could be so indifferent to the behests of heredity as to produce a diaphyseal or an epiphyseal bone on demand.

The thousand memories of the atoms comprising each osteoblast make it always breed true to type. The cell observes the same adhesion to type in response to the demands necessitated for repair following injury of pathological change in the bone. What a difference in the bone formation produced by each! The diaphyseal is robust in regeneration and vigorous in pouring out the osteoblastic embryonic tissue or callus which forms an abundant splintage for fractures. The other is very economical in its response to injury, just issuing sufficient ossific substance to cement the damaged parts. What a blessing it is so, for, were the epiphyseal cells as vigorous in bone production as the diaphyseal, innumerable stiff joints would result from injuries, particularly as there is no limiting membrane at these points. How we humans are controlled by little things! If these minute cells did not breed true, slight injuries would result in stiff joints, and our national game of football, for instance, would be imperilled! If the intramembranous parietal bone were as vigorous at repair as a diaphysis, the new-formed bone masses might press upon and injure the brain.

Can a Living Osteoblast be carried by the Blood Stream?

If, from traumatic or pathological cause, a living osteoblast gains entrance into a blood vessel, can it be carried by the blood stream to a distance and be deposited within the body in some structure other than osseous, and, if so, can growth of bone result therefrom?

Experiments were tried to test this possibility, but the difficulties of isolating and handling such a minute structure and our clumsiness in manipulation rendered them abortive. While still pursuing investigation, however, Dame Nature, with her delicacy of touch and inimitable ways, performed the experiment and presented a beautiful illustration of the possibility of the fact that the blood stream can carry osteoblasts to at least a short distance and deposit them in blood clot, where they may grow and reproduce themselves, forming bone. Already it has been recognized—from experimental inquiry into the growth of bone, inside of glass tubes placed in the living tissue, which became filled with blood clot and serum—that the osteoblasts from the bone placed therein proliferated and penetrated the blood clot, the latter becoming slowly absorbed.

The experiment which Nature performed occurred in a man who had sustained a fractured humerus: a spiculum of bone from the interior of the shaft penetrated the brachial artery and allowed the blood to escape into the tissues and partly to return into the vessel through the rent in its wall. The blood, in its escape, flowed over the bare fractured bone, and osteoblasts, as they formed on its surface, would not only be laved by it, but some might be detached by the force of the stream. Six weeks after, when the patient presented himself to me, an aneurysmal swelling was found to have formed in front of the humerus, limiting flexion at the elbow. The swelling was dense and inelastic, with very little pulsation, though pulsation had been a marked feature of the swelling at an early period after the injury. In the fibrinous layer in the periphery of the sac there were plaques of new osseous tissue of varying thickness, which covered a considerable portion of the circumference of the aneurysm. These had evidently formed from the osteoblasts which had issued from the fractured shaft, and especially from the spiculum of bone which had penetrated the coats of the artery.

The osteoblasts had become peripherally distributed and entangled in the meshes of the fibrin formed from the coagulated blood. In this instance the osteoblasts were conveyed by the blood stream for a short distance only, measured by one or two inches, but it established the possibility that living osteoblasts, in favourable circumstances, may be detached from a naked bone in process of regeneration and may be conveyed by the blood stream to a distance, and there grow and produce new bone.

If the osteoblasts, in peculiar circumstances, could be driven into the lumen of the blood vessels, the stream could carry them and deposit them in internal organs where they

might produce osseous infarctions. It is fortunate that such a series of circumstances favourable to the transference of osteoblasts from one place to another by the blood stream seldom occurs.

The mature osteoblasts are of a size that does not render their transference by the blood stream easy, but if nuclear budding occurred and some of the minute buds covered with cytoplasm—daughter cells—were detached, their minute proportions would facilitate conveyance.

Instance of Osteoblasts conveyed by the Blood Stream and deposited in the Cicatrix of a Laparotomy Wound.

That bone sometimes forms heterotopically in the midst of the soft tissues and in the muscles is well known, and these instances are generally the result of accidental osteoblastic distribution following upon injury to bones and the tendonous expansion of the muscles inserted into them.* Besides this, however, it is possible that osteoblasts in their germinal stage may be carried by the blood stream and may be localized by injury with extravasation of blood—in the same way as germs circulating in the blood stream may be located. An instance which bears this interpretation has just occurred, and has been communicated to me by my colleague Professor Muir, pathologist to the University of Glasgow, who has also given me some of the sections—which my colleague Mr. MacRae, whose case it was, gives me liberty to use.

The new bone was formed in a cicatrix in the midst of the abdominal muscles, at the site of a laparotomy wound made seventeen days previously. There had been no bone present in that tissue at the time of the operation.

It is probable that the original tumour in the intestine of the patient was one that secondarily involved bone, and that some of the osteoblasts had gained entrance into the blood stream and had been deposited at the site of the extravasation—the laparotomy wound. It is interesting that the typical *mature* form of osteoblast is seen in the bone sections situated in the cicatrix in the midst of the abdominal muscle.

Miniature Antler: Bone grown in Glass Tube inside of Tissue.

The bone grown in the glass tube experiments resembles in miniature the growth of the antler. The bone grown in the tube receives all its blood supply from its base in the pre-existing bone. The main artery of the bone in the glass tube passes up the centre, sending out branches which subdivide into capillaries, which are seen most abundantly at the periphery next the glass of the tube. It is round the thin-walled vessels that the osseous tissue first forms. Though generally these thin-walled capillaries intervene between the new bone in process of formation and the glass, yet in some places the osteoblasts are in actual contact with the glass, in the same way as the osteoblasts in the antler of the deer come into immediate contact with the dermal covering (the velvet) without the presence of any intervening membrane. There is here no periosteum—except the glass which acts the part of a limiting membrane. There is, therefore, no peripheral blood supply; it gets all its nutriment from the base, yet the bone thrives and grows rapidly and abundantly. The soft tissues surrounding the glass tube supply the proper temperature to facilitate the growth of its osseous contents, thus taking the place of the velvet in the antler of the deer.

The Silver Ring Experiments and Deductions from them.

Duhamel in 1739 placed a silver ring round a bone under the periosteum in a living animal and found some time after that the ring had become covered by bone. He inferred from this that the periosteum secreted bone, and his experiment and deduction therefrom have been accepted ever since, and have appeared in many of our textbooks during the last 184 years as one of the cogent reasons for our belief in the osteogenic functions of the periosteum.

The result of the experiment was correctly observed, but the deduction drawn therefrom was wrong and illogical. It was based on a single premiss. It has been demonstrated by me that when the periosteum has been removed from the bone and silver rings are placed on the naked *growing* shaft, the new peripheral osteoblasts emanating from bone rapidly form over the nude surface and completely cover the silver rings, enclosing them in a mass of bone—greater than would have formed had the periosteum remained intact.

Whatever views one may hold regarding the osteogenic function of the periosteum, it is hoped that in practice no one would sacrifice an otherwise healthy bone merely because the periosteum, from traumatic or pathological causes, happened to be removed. As long as the nutrient vessels maintain the blood supply to the diaphyses, the shaft of the bone will live, grow, and function.

Even portions of detached living bone severed from all blood supply, preserved aseptically and replaced among the tissues in suitable conditions, have a probability of life. The osteoblasts of the detached bone receive sufficient pabulum from the blood serum until the fresh vessels of the part penetrate the bone and bring nutritive relief. New osteoblastic formation in the shape of a vigorous germinal layer ensues and quickly consolidates into new osseous tissue which aids in fixing the detached bone in its proper place and afterwards in performing the function of the shaft.

Recognition of these facts will prevent the removal of useful, although "bare," bone, and limbs may be saved that would otherwise be sacrificed.

Bone Grafting: Report on Earliest Case.

Nude bone has been grown heterotopically in various parts of the body—such as in the vicinity of the great vessels in the neck, in the muscles of the extremities, in the body cavity attached at the omentum, etc. Young, growing, nude bone may be transplanted, and it will live and grow in its new situation and will form part of the body of man, becoming homogeneous with him.* Forty years ago this was demonstrated,† and since then bone grafting and transplantation have been frequently employed, especially during and since the great war. Many surgeons at home and abroad have used it very successfully and extensively, none more so than Morison of Newcastle.

Reference may be made in passing to the earliest cases of bone grafting in order to report their present condition, as sufficient time has elapsed to demonstrate, more nearly than the recent cases, the ultimate results obtained.

The first was one in which a boy, aged 3 years, came under observation after he had suffered for several months from pyogenic osteomyelitis of the humeral shaft, the dead, blackened bone of the arm lying loose inside the remnant of the periosteal sheath lined with granulation tissue. The loose dead bone was lifted out. As belief in the periosteum as a bone producer was at that time still in vogue, it was hoped that some portions of the bone might form from the periosteum. This did not take place, and the wound healed, leaving an arm without a shaft. One year afterwards the mother returned with her boy, desiring that the arm be amputated, as she said it was not only useless but required the sound arm to look after it. The shaft of the bone had not grown. He had neither a fulcrum nor a lever, and when he attempted to flex the forearm on the arm the muscles and soft tissues of the arm contracting wriggled like a loose hanging rope, the forearm dangling helplessly at the end of it. Instead of acceding to the mother's request to amputate the arm, bone grafting was resorted to. The humeral shaft was restored by the introduction of young growing human bone, removed for the correction of deformity from the tibiae. Six pieces of bone—one each from six different legs of three different persons—were divided into small fragments and were inserted between the muscles of the arm where the shaft ought to have been. These fragments became firmly united to one another and to the epiphyses so as to form a solid shaft. It supplied the fulcrum and lever, and enabled the arm to function, the bone growing along with the growth of the body—but not quite proportionately to it. The greatest growth occurred subsequently, mainly from the proximal epiphysis which had been preserved in part.

*See instances in the volume on *Growth of Bone*, by Macewen, published by Jas. MacLehose, Glasgow, 1912.

*Macewen: *Growth of Bone*, 1-12.

†Read before the Royal Society, London, May, 1881, and published in the *Proceedings* of the Royal Society, and also in the *Comptes Rendus de l'Académie des Sciences.*

while there was no growth from the distal epiphysis, the growing plate having been destroyed. The grafted part had somewhat increased in length and also markedly in thickness during ensuing years. While originally the grafted portion was in the centre of the arm, it was pushed toward the distal portion owing to the more vigorous growth from the proximal epiphysis. The arm is shorter than its neighbour, and no one would take it for an artist's model, but it has been of great service to its owner. Since manhood he has been able to maintain himself and his family by his own efforts—first as a joiner, then as laboratory attendant—and also, he has been able to go to the front and do his bit for King and country during the great war.

For the restoration of the lower jaw, grafting and transplanting of bone has been frequently successfully employed by many surgeons (especially in Frognal), restoring thereby the symmetry of the face, and, with the help of the dentist, the function of the lower jaw. In two such cases, operated on over eighteen years ago, the mandible has increased in size and strength commensurate with the rate of growth of the face, leaving little trace of the hideous deformities from which the patients would otherwise have been doomed to suffer.

One has endeavoured to give a glimpse into some phases of the comparative anatomy of the antler of the deer. Were one able to extend one's vision into other spheres of animal life, not only would they prove of absorbing interest intrinsically, broadening one's views, but they would shed fresh light on human structure in evolution and repair.

As to Nature as a whole, we are still in deepest darkness. Isn't there within each of us a mystery which has never yet been fathomed—a mystery which man shares in common with the minutest speck of primordial protoplasm of the wayside pool? The further we penetrate into the depths of Nature, the more numerous are the paths which are revealed for our searching, and to our finite eyes seem illimitable. Yet, in our search there are at least two things which we may find—one, not the extent, but a measure, of our abysmal ignorance; the other, that if we pursue our quest with a single purpose in search of truth for truth's sake only, we may get a glimpse of the spirit of Nature and feel the touch of The Hand that weaves the woof.

NORMAL AND MORBID CONDITIONS OF THE ADRENALS IN 100 HOSPITAL AND ASYLUM CASES;

WITH SPECIAL REFERENCE TO DEMENTIA PRAECOX.[*]

(With Special Plate.)

BY

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INTRODUCTION.

IN making *post-mortem* examinations at the London County Asylums I (F. W. M.) had long been struck with the frequency with which I found small suprarenal capsules in cases of dementia praecox as compared with general paralysis. I have already shown a regressive atrophy of the testes and ovaries in dementia praecox, and compared the conditions found in one hundred cases of each dying in hospitals and asylums.[5] There are many physiological and pathological facts showing the correlation of the reproductive organs with the cortex of the suprarenal gland, therefore it would not be surprising to find a diminution in weight of these glands.† There are certain clinical symptoms in dementia praecox which show the probability of the correlation of a morbid change in the medullary portion of the gland — namely, low blood pressure, feeble pulse, cold extremities, acrocyanosis, shallow breathing, low oxygen consumption, and katatonia. Dr. G. H. Rae Gibson,[16] working at Claybury at my suggestion, investigated the blood pressure in various types of insanity, especially in relation to the above clinical signs of dementia praecox.

Table of Average Blood Pressure in 143 Cases.

	Males.		Females.	
	Average Blood Pressure.	Average Age.	Average Blood Pressure.	Average Age.
Dementia praecox katatonia ...	113	28	111	28
Dementia praecox hebephrenia	118	30	114	27
Dementia praecox paranoia ...	113	35	125	40
Epilepsy	120	36	123	39.5
General paralysis	138	45	125	44.5
Congenital imbecility	115	21	109	34.5

I should not attach much importance to the results of the average blood pressure in these various groups, for where the difference is great—for example, dementia praecox and general paralysis—the age factor might be cited as the causal relationship of the difference. But on examining the tables in which the blood pressure of each of the 143 cases is given, one finds that in 10 of the cases of katatonic dementia praecox, and in 4 of the 27 cases of hebephrenic dementia praecox, the blood pressure is under 100; whereas in the 12 cases of epilepsy, in the 15 cases of general paralysis, and in 9 of the 10 cases of congenital imbecility, there is not a single case in which the blood pressure is under 100; moreover, in 5 out of the 10 cases of katatonia, and 2 out of the 4 cases of hebephrenia, the blood pressure was very low—under 90. In not one of the cases of general paralysis was it under 120. These observations were made before I undertook the investigation of the reproductive endocrine system of glands.

Dr. Dawson, assistant medical officer at the Maudsley Hospital, undertook last year, while assistant medical officer at Hanwell Mental Hospital, an investigation regarding the blood pressure and Goetsch reaction in dementia praecox. The following is a summary of Dr. Dawson's results.

The Blood Pressure and Goetsch Reaction in Dementia Praecox.

In a series of 50 cases the blood pressure was as follows:

	No. of Cases.	Systolic Blood Pressure.		
		Average.	Minimum.	Maximum.
Katatonics	27	116 mm.	93 mm.	135 mm.
Simple dementia praecox ...	14	117 mm.	104 mm.	126 mm.
Paranoid dementia praecox ..	7	120 mm.	115 mm.	136 mm.
Hebephrenic dementia praecox	2	115 & 122		

The diastolic reading was between 55 and 65 mm. in all cases.

Goetsch Reaction.—A subcuticular injection of 0.05 c.cm. of 1 in 2,000 Parke, Davis and Co. adrenaline solution was made in all cases. Two cases only gave a normal reaction; these had a systolic blood pressure of 122 and 128 respectively. One was a katatonic and the other a simple dementia praecox case with congenital defect. Eighteen cases gave a moderate reaction: in 13 of these the blood pressure was 120 or under (minimum 104); in 5 it was over 120 (maximum 130). Thirty cases reacted only faintly: in 25 the blood pressure was 120 or under (minimum 98); in 5 it was over 120 (maximum 136).

The test was repeated in cases with a high blood pressure which gave a faint reaction, and the same result was obtained. In several cases it was found that a faint reaction might be intensified by administration of thyroid extract, but without material alteration in the blood pressure.

Katatonic Stupor.—Nine cases of this variety of dementia praecox were included in the series. One case had a blood pressure of 135, but reacted faintly to the Goetsch test. In the other 8 cases

[*] This research was carried out with the aid of a grant from the Board of Control.

† Dr. Langdon Brown, in his interesting Croonian Lectures on the sympathetic nervous system in disease, says: "It is both interesting and suggestive to note that an important group of endocrine glands—the adrenals, the thyroid, and the pituitary—have three features in common: the secretion of each is stimulated by the sympathetic, they all lower carbohydrate tolerance, and they all act and react with the reproductive organs."

the blood pressure was below normal. The reaction to the Goetsch test was faint in all cases except one, in which it was moderate but less than normal.

So far, then, as the Goetsch reaction and the blood pressure are any indication, cases of dementia praecox, especially of the katatonic variety, appear to suffer from adrenal inadequacy.

Some years ago, in conjunction with Professor Halliburton, I undertook[17] a histological examination of the suprarenal gland of patients dying in Claybury Asylum, and we correlated the same with the chemical and physiological investigation of the adrenaline content of the gland. No definite results were obtainable, but this is not surprising, because the amount depends upon the cause of death and the time lapsing between death and the *post-mortem* examination. For this reason I did not think that comparative results by chemical and physiological investigations would be of value. I therefore resolved to pursue an investigation of the gland by the same histological methods as I adopted in the case of the reproductive organs. This work has been largely carried out under my direction by Dr. Emslie Hutton.

Histological Examination of the Adrenal Glands in 100 Cases.

The material dealt with in this article was collected from patients who died in the London mental hospitals, and also hospitals for consumption and various military and general hospitals.* In the majority of the mental cases the reproductive organs have already been examined, and work is going on at present on the thyroid and pituitary of these cases. So far as we have been able to ascertain from a search of the bibliography, there has been no complete systematic investigation of a similar nature.

One hundred cases were examined and classified, and the numbers in each group are tabulated below. The number in the class dementia praecox is large, the principal reason for carrying out the work being to afford an opportunity for determining if there is a change in the adrenal in this disease, the great importance of which is obvious from the fact that the bulk of incurable cases in mental hospitals belong to this group of the insanities. Moreover, many of the symptoms of this disease, as already indicated, point to an affection of the medulla of the adrenal gland. The number of hospital cases (which includes thirteen cases of death due to severe accident) is also large, for it is necessary to have a good picture of the normal. A comparatively large number of cases of tuberculosis in young adults were examined; these were required for comparison with cases of dementia praecox, the majority of whom die eventually from tuberculous affections. It has, indeed, been stated that 75 per cent. of the dementia praecox cases die of tuberculosis, and the hypothesis that tuberculosis stands in causal relation to dementia praecox might therefore be justified. Against this, however, is the fact that if this were so similar clinical symptoms and morbid histological changes to those found in dementia praecox should occur in cases dying of tuberculosis without mental symptoms. Moreover, some of the cases of dementia praecox died from pneumonia, dysentery, and suicide. These cases presented no signs of tuberculosis *post mortem*, although the histological changes in the reproductive organs and the brain were similar.

Classification of Cases.

Mental Hospitals:	
Dementia praecox	26
Other psychoses	8
General paralysis of the insane	22
Hospitals for Consumption:	
Tuberculosis	12
General and Military Hospitals:	
Death as result of severe accident	13
Death from various general causes	19
	100 cases.

Method of Examination.

It was impossible to arrange that the glands should be removed by the same person, but they were taken out carefully, and in most cases arrived in a satisfactory condition. They were thoroughly freed of extraneous tissue in the laboratory, each being weighed separately, and then hardened for two months in formol. Each was cut across in the same way, and as nearly as possible through the thickest parts of each gland. Sections were cut by the freezing method and were of approximately equal thickness; various stains were used, the chief of which were haematoxylin and eosin, Scharlach R. alone and with haematoxylin counter-stain. Most of the details of the fibrous and nuclear changes were observed in sections stained by the Del Rio Hortega* method, or by that method counter-stained by eosin. The sections so stained were examined systematically. Their outline, magnified by means of an Edinger projection apparatus, was made; this showed very clearly the relative thickness of the cortex and medulla, and the general size of the organ. Means were also taken for obtaining an approximate idea of the relative amounts of cortex and medulla. The section was then microscopically examined and a full account of the appearances was recorded. The nuclear ratio in the medulla (to be explained later) was taken in each case.

Before proceeding to describe the morbid histological changes met with it is desirable to give a brief account of the weight and microscopic appearances presented by the normal human gland.

The Normal Adrenal Gland.

Each organ weighs from 6.5 to 7.5 grams, some, however, as will be shown later, weigh slightly more; the body weight must be taken into account when judging whether a case is lighter or heavier than the normal. According, however, to the very careful records of Kojima, body weight does not seem to have much influence.[14] The medulla is at least as wide as the cortex, and more often exceeds it in width at the thickest part of the gland. The cortex is composed of well defined polygonal cells, arranged in columns (zona fasciculata). Near the surface of the organ the columns have a more open arrangement (zona glomerulosa); near the medulla the arrangement is much more open (zona reticularis), and for convenience of description these terms will be used throughout this paper. The cells are well defined, and contain one, and sometimes two, darkly stained nuclei. They are packed with a glistening refractile lipoid substance; this is, as a rule, present in all the cells of the cortex, but is sometimes absent from its innermost layers. In these latter layers are often seen brown pigmented granules tightly packed in the cell; their significance is not yet known.[3] The cortical adenomata, such as are described by Elliot[7] and Vasilesco,[8] have never been observed in this series of cases. The fibrous tissue of the cortex continuous with that of the capsule is well defined, but of delicate structure, and runs down in a septa-like fashion between the cells carrying the blood vessels and lymphatics. The medulla will now be described fully, as it is here that most of the more definite microscopic changes, especially in dementia praecox, have been observed. There is a light fibrous groundwork with fine offshoots surrounding groups of cells; there is no pericellular arrangement of the fibres. The cells have a different arrangement and differ in form from those of the cortex. They are arranged more loosely in irregular columns with large interspersed blood sinuses; a striking feature is the appearance of the large vessels with very thick muscular coats; generally speaking, the medullary cells are arranged around and in contact with these vessels. Sometimes, however, the sections show the cells of the zona reticularis arranged around and in close contact with them. The cells are polygonal and larger than those of the cortex;

* We wish to thank the superintendents and medical officers of the London County mental hospitals for kindly forwarding material and notes of the cases, also the pathologists to the general hospitals and hospitals for consumption who have assisted us by providing the material for this investigation. We are especially indebted to Dr. Roodhouse Gloyne of the City of London Hospital for Diseases of the Chest, Victoria Park, E.2, for material.

* *Nuclear Staining: Del Rio Hortega Method.*—Sections cut by the freezing method are taken from distilled water, placed into the silver solution (see below), and warmed at a temperature of 50° to 55° C. until slightly yellow in colour. They are then placed direct into a 2 per cent. solution of formol (neutralized by calcium carbonate) until the section becomes black; washed in distilled water for about one minute, and then placed into gold chloride solution (1 in 500) until the section becomes grey, usually about half a minute; then into a 3 per cent. solution of sodium hyposulphite for five minutes—in this it becomes a rose colour. Wash in water, fix section to slide, blot off excess of water, and dehydrate with a creosote-carbolic-xylol mixture (creosote 10 c.cm., carbolic acid 10 grams, xylol 60 c.cm.), and mount in Canada balsam.

Silver Solution.—5 c.cm. of a 10 per cent. solution of $AgNO_3$, precipitated by 20 c.cm. of a 5 per cent. solution of sodium carbonate; dissolve precipitate by a few drops of ammonia, and add water to 55 c.cm.

they may be also very irregular, and even ragged in outline, in this respect differing greatly from those of the cortex, which are sharply defined and compact. Many of the cells contain very fine droplets of lipoid. Sections treated with chrome show brown granules in many of the medullary cells, and most workers are of opinion that these chromaffin granules are limited to the medulla, though Cramer[4] shows very convincingly that they are also to be found in the zona reticularis. We have also noted this in cases, and apparently these granules occur in greater abundance in the zona reticularis than in the medulla; at any rate, this applies to the human subject, according to our experience. The cytoplasm of the cells stains well with eosin, and there is but little vacuolation; with the oil-immersion lens numbers of fine eosin-stained granules can be seen—? mitochondria.

The nucleus is small in comparison to the cell; it is round, stains deeply, and contains numerous chromatin granules, some intensely black and coarse when stained by Del Rio Hortega method, and others of dust-like fineness; a distinct and fairly complicated chromatic skein is present. The cell nuclei are for the most part of uniform size and shape. In normal glands there are very few nuclei without surrounding cytoplasm, and those are paler and contain fewer granules than the nuclei contained in the cells. Moreover, instead of being round, they are generally oval or fusiform in shape. Some of these may be fibroblastic.

Mitosis has been observed in the cells of the medulla of many glands and also in the zona reticularis. Graham[9] has found mitosis in the medulla, but much less frequently than in the cortex. In many cases groups of sympathetic ganglion cells were found in the medulla or just between the cortex and medulla, and occasionally bundles of non-medullated fibres. Cortex and medulla react as a whole in a different way to stains, for whereas the medulla takes up the basic, the cortex takes the acid stain.

Size and Weight of Adrenal Glands in One Hundred Cases.

Size.—The adrenals are glands so small and light that slight differences in their size and weight may have a certain significance. These differences may sometimes be marked and obvious even at the *post-mortem* examination; they can be still more clearly observed upon studying a stained section through the gland in its thickest part. It can be noted, on the one hand, without the aid of the microscope that the adrenal glands of a case of dementia praecox are, as a general rule, smaller than in cases belonging to any other class; and, on the other hand, the adrenal glands of a case of general paralysis are usually larger. It was also noted that a section of the gland in a case of tuberculosis did not differ, as a general rule, from that of the section of the gland of a normal hospital case dying of injury.

Weight.—The average weight for each group of cases was taken. Many of the glands in dementia praecox only weighed from 2.8 to 4 grams; the average weight, however, in this class was higher than might have been expected. Several factors contributed to the raising of this average, of which the following were the principal.

One case with heavy adrenals had been clinically diagnosed as dementia praecox and is included in the list, but its history showed that it was doubtful whether it was a case of dementia praecox.

Four were puerperal cases, which would probably account for some increase of the weight owing to the enlargement of the cortex[10] connected with the puerperal condition.

A few adrenals were heavier than normal, owing to the great fibrosis of their medulla.

The average weight of adrenals in dementia praecox cases = 6.326 grams (women = 6.548 grams, men = 5.327 grams).

Average weights were as follows:

Dementia praecox	6.32 grams
Other psychoses	6.60 ,,
General paralysis	7.35 ,,
Tuberculous cases	6.28 ,,
Hospital cases	7.21 ,,

The weights in the different classes are probably more clearly shown in the following table. The sum of the right and left adrenal is taken in each case, and the percentage of cases between certain weights is given.

	5 to 10 grams.	10.1 to 15 grams.	15.1 to 20 grams.	20.1 to 25 grams.
	Per cent.	Per cent.	Per cent.	Per cent.
Dementia praecox (21 cases) ...	43	29	28	—
General paralysis of the insane (21 cases)	9	43	43	5
Various psychoses (8 cases) ...	25	50	25	—
Tuberculosis (10 cases)	20	70	10	—
Hospital cases (23)	16	42	37	5

Note the high percentage of dementia praecox cases between 5 and 10 grams, and of cases of general paralysis of the insane between 15 and 25 grams.

The average for the normal gland of this series is 7.21 grams—a much higher average than Elliot's, which was between 4 and 5 grams.[7] Testut[11] gives 6 to 7 grams as the average weight, and Vierordt,[12] working from a very large number of cases, gives 7.3 grams as his average.

Ratio of the Area of Cortex to that of the Medulla.

So striking were the differences in the width of the medulla in the different cases that it was thought advisable to find means of arriving at some idea of the relative area of the cortex and medulla. This was at first done by actual comparative microscopic measurements through the thickest portion of the medulla, but it was felt that this method was open to many fallacies, so the following method was adopted. It has been previously explained how the glands were cut as nearly as possible through the thickest portion of the gland. The magnified outline of the section was drawn on paper of equal thickness by means of an Edinger projection apparatus. The medulla was also outlined, and this is a very simple matter, for, owing to the fact that their staining reactions are so different, the cortex and medulla stand out quite clearly from each other. The medulla and cortex having been delineated upon the paper were then separately cut out and each accurately weighed; thus a representation of the area in terms of weight was obtained. It was found that the normal glands showed an average ratio of 2.7—that is, the cortex covered 2.7 times as much area as the medulla. Tuberculosis cases showed an average ratio of 3.7, and general paralytics one of 3.2. The average for the dementia praecox cases was, however, a much higher one, and showed that the cortex covered 8.6 times more area than that of the medulla. If this fact be coupled with the fact that the average dementia praecox adrenal is relatively a smaller organ, it is probable that the deficiency in weight in most of the cases was, in great measure, due to deficiency in medulla. In fact, in some of these cases the medulla is a mere narrow strip of tissue; in a few cases, however, the medulla is as extensive as in normal cases because of great substitutive fibrous hyperplasia. The cases investigated by Dr. Dawson (referred to in the earlier part of this communication) have for the most part not died, therefore we have no precise data regarding the correlation of blood pressure, Goetsch reaction, acrocyanosis, katatonia, and anergic stupor with the degree of atrophous change in the medulla of the adrenal gland.

I am at present instituting an intensive research on the relation of the histological changes in the reproductive organs, the whole endocrine system, and the vegetative nervous system, to carefully recorded clinical investigations, including basic metabolism in individual selected cases of dementia praecox. (F. W. M.)

There does not seem to be any literature in which accurate figures can be found to compare with those of this series; Elliot and Tuckett,[13] however, have worked out this ratio in animals, and from the figures obtained have deduced the proportions of cortex and medulla in man. The proportion of cortex to medulla which they give is somewhat higher than that which we have found in this series. A graph shows well the ratio of the cortex to the medulla in the different classes of case.

Histological Changes in the Cortex.

(*a*) *Lipoid.*—It was found that in most of the cases of dementia praecox, in all cases of general paralysis and the other psychoses, as in the normal cases, it was apparent to

The following are drawings of sections through that part of the adrenal gland where the medulla is thickest. They are drawn from the slide preparation by aid of an Edinger apparatus with a magnification of 2.5.

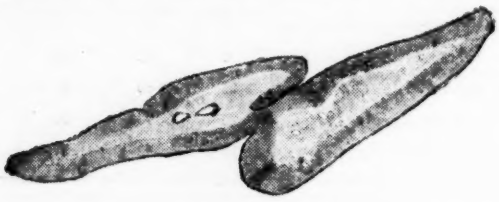

FIG. A.—Section of adrenal gland of a male, aged 20, who died from suppurative encephalitis two months after a severe bullet wound of the head. Note the extensive medullary portion.

FIG. B.—Section of adrenal gland of a case of general paralysis of the insane of two years' duration. Note the extensive medullary portion.

FIG. C.—Section of adrenal gland of a case of epilepsy who was for three years before death in a mental hospital, where she died of tuberculosis, aged 38 years. Note the extensive medullary portion.

FIG. D.—Section of adrenal gland of a case of dementia praecox who was for five years in a mental hospital, where he died of dysentery, aged 30 years. Note the extensive area of the medulla, which stains black because it is composed almost entirely of thick strands of fibrous tissue.

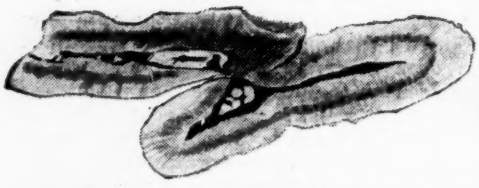

FIG. E.—Section of adrenal gland of a case of dementia praecox who was for two years in a mental hospital, where he died of pneumonia at the age of 25 years. Note the narrow strip of medulla, which is deeply stained because of the fibrous tissue which largely composes it.

FIG. F.—Section of adrenal gland of a case of dementia praecox who was for sixteen years in a mental hospital, where she died, aged 33 years. Note the narrow strip of medullary tissue, which, however, is not deeply stained, as there is no marked fibrosis present.

FIG. G.—Section of the adrenal gland of a case of dementia praecox who was for two years in a mental hospital, where she died, aged 29 years. Note the narrow strip of medullary tissue.

the naked eye that there was abundance of lipoid present throughout the cortex; the cortical cells in the three zones were filled with coarse to fine droplets of this refractile substance. In a few of the dementia praecox cases dying of tuberculosis lipoid was entirely absent, and in many it was reduced in amount to a variable degree. In one case who died of dysentery it was entirely absent. It was absent also in two cases of head wound where death was caused by septicaemia. It was also absent or much reduced in amount in cases of young adults dying from tuberculosis.

It may be said that the lipoid was absent or diminished where acute or chronic septic conditions were present. This is in agreement with what other workers, among whom are Elliot[7] and Mott, have found, and supports the view that it is an important source of antitoxins. It cannot be said that the lipoid content seems to have any kind of relationship to the mental condition of the patient. It has, probably, as Mott[5] has shown, an important relation to the function of reproduction. In one of the cases of dementia praecox of this series, the testis was absent on one side and on that side the adrenal gland was one-half the size of the other. A full account of this case was given in a previous communcation.[18]

(*b*) *Fibrous Septa.*—Several of the cases showed thickening of the septa, but this did not seem to have any relation to the different classes of case. A fair number of general paralytics, and also a proportion of the normal cases, showed this appearance. When this was present in the cortex there was not always a corresponding fibrosis in the medulla.

(*c*) *Cells.*—It was not observed that these showed any definite changes. In the zona reticularis in some cases of dementia praecox active mitosis was seen, but it was not generally present; here, too, chromaffin granules were observed in some of the cases.

(*d*) *Lymphocytic Infiltration.*—In many of the general paralytic cases it was observed that along the lines of the fibrous septa there was an infiltration of small lymphocytes. In some cases there were definite clumps of these small lymphocytes near the outer part of the cortex, but more often the appearance was simply one of infiltration along the fibrous septa. In one of the hospital cases this appearance was present, but in no other case was it observed.

Changes in the Medulla.

It was in the medulla that the striking changes were seen; the first of these—namely, the differences in the amount of medulla present in the gland—has already been dealt with, and the microscopic changes will now be discussed.

(*a*) *Cells.*—In dementia praecox, even in very early cases, there were distinct cellular changes. Sometimes these changes were only found in some of the cells and many normal cells were present. The cells were as a rule smaller than the normal, and their cytoplasm was much vacuolated. The cell nuclei varied much in shape and size, and were generally smaller than the normal nucleus, though they were larger *in proportion* to the cell; they were not always round and many tended to be oval. They also stained poorly and showed fewer and finer granules than the normal nucleus, and many exhibited a very faint and simple chromatin network. Syncytia containing numerous polymorphic nuclei were frequently seen. There were a great number of nuclei present which were not surrounded by cytoplasm; these either occurred in patches or were diffused throughout the medulla. These nuclei were nearly round, but tended to be oval or fusiform, and many were larger, paler, and contained fewer chromatin granules than the nuclei seen in cells. In various psychoses, such as manic-depressive cases, somewhat similar changes were found, but never to such a marked

degree as in cases of dementia praecox. Syncytia were sometimes seen and the cells showed in some cases a certain amount of atrophy and vacuolation; slight nuclear proliferation was present in a few of these cases. A few cases of tuberculosis showed atrophy of the cells and vacuolation of their cytoplasm, but most of the specimens presented a normal appearance. A few of the hospital cases showed slight atrophy of the cells and vacuolation of their cytoplasm, but in most of them no definite cell changes were observed comparable with those seen in dementia praecox.

(*b*) *Fibrosis.*—There seemed to be a certain amount of fibrosis in all the dementia praecox cases, and this was also seen, though to a slighter extent, in some of the other psychoses. This fibrous hyperplasia was sometimes coarse and consisted of heavy wavy bundles which extended round groups of cells. On the other hand, it was in many cases a very fine fibrosis and delicate strands of fibrous tissue ramified between individual cells. In one dementia praecox case there were such thick bands of organized fibrous tissue that they could even be seen in sections by the aid of a hand lens. In a few of these cases the medulla consisted of little else but fibrous tissue, and the amount of cellular tissue was very small. It could not be said it was this fibrosis alone that caused the cell change, for in some adrenals that showed a marked fibrosis the cells were fairly normal. General paralytic cases showed a fair amount of fibrosis, but there was no pericellular arrangement of the fibres. The majority of the hospital and tuberculosis cases showed no fibrous hyperplasia, though there were a few specimens in which this was present.

(*c*) *Nuclear Ratio.*—It was thought that as there were in some cases such numbers of nuclei and so few cells, it might be instructive to count the numbers of nuclei and of cells in a given area. This was done, the area used being 0.25 mm. The numbers of nuclei and of cells were separately counted in three such areas and the averages taken. The number of nuclei was divided by the number of cells and a ratio of nuclei to cells was obtained. The averages of the nuclear ratio in the different classes of case were as follows:

Dementia praecox	6.37 to a cell
Other psychoses	3.82 ,, ,,
General paralysis	1.85 ,, ,,
Hospital cases	1.94 ,, ,,
Tuberculosis	1.84 ,, ,,

A glance at the above figures shows that the hospital, the tuberculosis, and the general paralytic cases have an almost identical average ratio. The dementia praecox cases show by far the highest ratio of all. The other psychoses occupy a place midway between the others, and it would seem as though this were possibly a stage of the process towards what is found in the dementia praecox cases.

(*d*) *Lymphocytosis.*—In many of the general paralytic cases a lymphocytosis was present along the line of the fibrous septa of the medulla and the cortex. This was very marked in some of the cases where the lymphocytes formed clumps which could be well seen even under a low power magnification. Some of the adrenals showed this much more markedly than others, and even in those cases where it was very marked the glands seemed to be otherwise practically normal.

(*e*) *Lipoid.*—In the great majority of cases this was present in small amounts in the medulla. It was distributed in fine droplets and was never present in all the cells, and very often in quite a small proportion of them. It was absent, as in the cortex, in cases where there was an acute or chronic septic condition.

Summary of Distinctive Changes which Characterize the Different Classes of Case.

Dementia Praecox.

Much more striking changes were found in this class of case than in any other, and these will now be given seriatim.

(*a*) *Size.*—The organs were smaller than the normal; this was quite apparent to the naked eye, and very marked in the slide preparation. They generally had a thin and shrunken appearance which was as a rule quite typical.

(*b*) *Weight.*—As a rule the organs were much lighter than the normal and many of them weighed only from 2.8 to 5 grams. The average weight was somewhat higher than this, but it has been already shown why this was so.

(*c*) *Medulla as a Whole.*—This was distinctly narrowed and in some cases was a mere narrow strip of tissue. In a few cases the medulla was as wide or wider than the normal, but this may be accounted for by the fact that in these cases there was marked fibrous hyperplasia and only comparatively few normal medullary cells. In one of the cases the fibrous bands were so thick that they could just be seen by the naked eye.

(*d*) *Medullary Cells and Nuclei.*—The cells were smaller than the normal and their cytoplasm much vacuolated. In some cases even atrophous cells were very few in number. The nuclei were, relatively to the normal, smaller and paler, the chromatin granules were fewer and finer, and the chromatin skein was simple or indefinite. They varied much in shape and size, and were usually out of proportion to the size of the cell. There were many nuclei present which were not surrounded by cytoplasm, and these were pale and larger than those which were surrounded by cytoplasm; they were generally oval or fusiform in shape, and the granules were scanty and fine. The ratio of nuclei to each cell (this had previously been explained) was 6.37, while the normal was 1.94.

(*e*) *Fibrous Tissue.*—Medullary hyperplasia has already been very fully described; it varied enormously. It was in some cases slight, and in others there was great coarsening of the fibrous framework; it may be a very fine pericellular ramification, or there may be thick organized strands of fibrous tissue.

(*f*) *Cortex.*—Here little or no change was observed, except that in some cases the fibrous septa were much thickened. Where there was fibrosis in the medullary portion it was not observed that there was always a corresponding thickening of the fibrous septa of the cortex. Lipoid was absent only in cases dying of acute or chronic septic conditions.

Other Psychoses.

In manic-depressive cases changes very similar to those in early cases of dementia praecox were seen in some of the cases. The cells were in some cases smaller, the nuclei immature, the cytoplasm was vacuolated, and a slight fibrosis was sometimes present. In no cases were the changes very advanced. The ratio of nuclei in the medulla was high—3.82 to a cell—which is midway between the ratio of the normal and dementia praecox cases.

General Paralysis.

The adrenals of these cases were larger than the normal, and there were few exceptions to this; this was very noticeable even on naked-eye examination of the slide preparation, and the average weight was greater. The medulla in all cases was large and wide, and here fibrosis was occasionally present, but never to any great extent. The cells were normal or practically normal throughout, and contained a great number of granules and a complicated chromatin skein. In some cases there was slight vacuolation of the cytoplasm, and in a few of the cases syncytia were present. The nuclear ratio corresponded with that of the normal adrenals.

The most marked feature was the presence of lymphocytosis, and this was seen along the line of the fibrous tissue septa in both cortex and medulla. In many of the glands there were such large collections of lymphocytes that well marked clumps were present, and these could be well seen even under the low power of the microscope. This lymphocytic infiltration may to some extent account for the weight of the adrenals in this disease even exceeding the average normal. But we are quite sure that this does not wholly account for the large adrenal glands in general paralysis. More probable is it that the large glands are connected with a strong sexual instinct. Spirochaetes were not seen; the Hortega method would probably have shown them had they been present. It is probable that these lymphocytes came from the cerebro-spinal fluid.

Tuberculosis Cases.

There was nothing remarkable to note about most of these cases, as they did not differ from the normal except in their cortical lipoid content. Sometimes this

medullary cells showed atrophy and vacuolation of the cytoplasm, but the nuclei showed but little deviation from the normal and there was little or no fibrosis. The medullary nuclear ratio was the same as in normal cases. In many of the cases the lipoid was entirely absent, and in nearly all of the remainder it was diminished in amount.

It will thus be seen that the histological appearances were different from those in dementia praecox. It might have been suggested that the changes in the adrenals of the dementia praecox cases were due to the tuberculosis from which they so often die. But this is not a fact, for twelve cases of tuberculosis occurring in young sane adults were examined with the above negative results. It may be observed that no lymphocytosis was observed in these twelve cases. There were, however, three cases, which were not used, as they showed tuberculous foci in the medulla. None of the many cases of dementia praecox that died of tuberculosis showed tuberculous foci in the adrenal glands. Another argument against the change in the medullary cells being due to tuberculosis is that some of the cases of dementia praecox died of dysentery and pneumonia after a short illness, and these presented no signs of tuberculosis at the *post-mortem* examination.

Extracts from Cases.

Space does not permit of extracts from all the cases, so eleven have been selected, and very brief notes appended. Two are hospital cases, four are cases of dementia praecox, two are cases of psychoses, one is a case of general paralysis, and two are cases of tuberculosis.

CASE I.

Case of duodenal ulcer; death occurring after operation. Adrenals weigh 10 grams and 9.5 grams respectively. The cortex and medulla are in normal proportion to each other; abundant lipoid is present in the cortex in all its layers, and there is no evidence of fibrosis. The medullary cells are of the normal shape and size, they stain well and show little or no vacuolation. The nuclei are round and of a uniform size and shape; they stain deeply and show many chromatin granules, some coarse and darkly stained, and others of dust-like fineness. The nuclear ratio is 1.2 per cell.

CASE II.

McK., aged 19 years. Admitted to Charing Cross Hospital ten days after accident. The wound was in the mid-dorsal region, and was foul and septic; there was complete paraplegia, and death occurred seven days later of septicaemia. Adrenals weigh 9.7 and 12.5 grams respectively. The medulla is large and wide and in normal proportion to the cortex; lipoid is entirely absent throughout. There is no fibrosis, and the medullary cells show a typically normal appearance. Nuclear ratio is 1.1.

CASE III.

W. F. S.; dementia praecox. Male, aged 18 years at death. He was for two years in a mental hospital, where he died, and before admission was said to have been ill for only four months. He was fairly intelligent, but childish mentally and physically for his age. He was hallucinated for general sensation and had curious feelings in his legs, upon which he based various delusions. He was quiet and depressed and was distinctly anergic, and on admission was certified as adolescent melancholia. For six months after admission he improved slightly, but then began to deteriorate and became apathetic, untidy, and anergic. He rapidly became more demented and developed tuberculosis, from which he died. Adrenals were small and weighed 3.9 and 4.3 grams respectively. The medulla showed marked pericellular fibrosis, and there was scarcely a normal cell present. The nuclear ratio is high.

CASE IV.

P.; dementia praecox. Female, aged 29 years at death. She was for two years in a mental hospital, where she died. Before admission there was several months' history of strange behaviour, moodiness, solitariness, and abstraction; she had one child. On admission she was restless, excited, impulsive, and disoriented. She was emotional, wept for no apparent reason, then laughed in a senseless fashion, grimaced and rolled her eyes. Six months after admission she showed negativism, and stereotypy of manner and speech. Six months before death her health began to be very poor and she became anaemic, cyanosed, and the extremities were oedematous. The Goetsch reaction was faint. She was stuporose and the breathing was shallow and slow. Tuberculosis was suspected, though physical signs were negative, and there was no rise of temperature. Gradual emaciation occurred and death. *Post-mortem* examination showed extensive pulmonary and intestinal tuberculosis. Adrenals: The medulla of this organ is a mere strip of tissue, and in this few normal cells can be seen. The cells are small and atrophied, there is considerable fibrosis, and the marked nuclear changes already described are found. The nuclear ratio is high.

CASE V.

G. T.; dementia praecox. Male, aged 37 years at death. He was for four years in a mental hospital, where he died from pulmonary tuberculosis. He was a typical case of dementia praecox of the type where progressive dementia is the most marked symptom. The adrenals weighed only 2.8 and 3.9 grams respectively and are small and shrunken in appearance. The medulla shows a pericellular fibrosis, and many of the cells are atrophied. There are, however, a fair number of almost normal cells. There are advanced nuclear changes and the nuclear ratio is high.

CASE VI.

R. M. W.: dementia praecox. Male, aged 19 years at death. He was for eight months in a mental hospital, where he died of exhaustion; there was nothing else to note in the *post-mortem* examination. He was a typical case of dementia praecox. There was a bad family history: his mother and father were aged 20 and 21 years respectively at their marriage, and have been separated for eighteen years. The mother was violent and drank heavily; the maternal grandmother died in a mental hospital; a maternal uncle and an elder sister were in a mental hospital at the same time as the patient. On admission he was sullen and depressed, but subject to attacks of acute excitement, when he was most impulsive and resistant. He steadily deteriorated mentally and physically. Adrenals: The organs are of normal size, and the medulla is not diminished in extent. The medullary cells vary to a considerable extent, some being normal and others being atrophied and showing much vacuolation of the cytoplasm. There are nuclear changes, but these are not very advanced and the nuclear ratio is low.

CASE VII.

E. B.; mental defective with polyglandular insufficiency. Female, aged 18 years. She died four days after admission to hospital, and at the *post-mortem* examination miliary tuberculosis was found. Little was known of her history as she was brought in by the police as a lost child at the age of 4 years and was at a special school. The adrenals weighed 2.5 and 4 grams respectively. The medulla shows fibrous hyperplasia and the cells vary greatly, some are normal and others show atrophy and vacuolation. The nuclei vary greatly in size, and there is a high nuclear ratio.

CASE VIII.

C. B., male, aged 50 years; melancholia. He was in a mental hospital for three years, where he died of pulmonary tuberculosis

DESCRIPTION OF SPECIAL PLATE.

FIG. 1.—Drawing of a section of medullary portion of the adrenal gland of a male, aged 20 years, who died as a result of a bullet wound of the head; stained Del Rio Hortega method. (A macroscopic drawing of this gland is Fig. A.) Note the light fibrous groundwork, the abundant cytoplasm of the cells, the nuclei, which vary little in size or staining, and which contain abundant chromatin granules, both coarse and fine. (Magnification 800.)

FIG. 2.—Drawing of a section of medullary portion of the adrenal gland; stained Del Rio Hortega method. A case of dementia praecox who was for two years in a mental hospital, where he died of pneumonia at the age of 25 years. (A macroscopic drawing of this gland is Fig. E.) Note the fibrous groundwork, which tends to be pericellular and somewhat coarse. The cells show scanty cytoplasm, and some of the nuclei have no surrounding cell body. The nuclei are irregular in shape and show great variation in size and in intensity of staining; they contain fewer and on the whole finer chromatin granules than the nuclei in Fig. 1. (Magnification 800.)

FIG. 3.—Photomicrograph of a section of the medullary portion of the adrenal of the same case as Fig. 1, but the magnification is much less; stained Del Rio Hortega method. (Magnification 450.)

FIG. 4.—Photomicrograph of a section of adrenal gland of a case of chronic pulmonary tuberculosis in a man who died at the age of 32 years. Stained Del Rio Hortega method. The fibrous groundwork is light; the cells show exhaustion of the cytoplasm, which is small in amount and shows vacuolation. The nuclei, however, are of equal size, and show abundant chromatin granules, both coarse and fine. (Magnification 450.)

FIG. 5.—Photomicrograph of the medullary portion of the adrenal gland of a case of general paralysis of the insane, to show the infiltration with small lymphocytes that occurs here and there throughout the gland. A few cells are seen at the corner of the photograph, and these contain abundant cytoplasm and nuclei, which are regular in form and staining, and which contain abundant chromatin granules. (Magnification 350.)

FIG. 6.—Photomicrograph of a section of the medullary portion of the adrenal gland of a case of dementia praecox who was for eighteen months in a mental hospital, where he died of pneumonia following influenza at the age of 21 years. The cells in this case vary much. In parts, as at the top of the photograph, can be seen cells which approach the normal in appearance. Throughout the specimen small cells are seen, the cytoplasm shows vacuolation, and the nuclei show variation in size. (Magnification 450.)

FIG. 7.—Photomicrograph of a section of the medullary portion of the adrenal gland of a case of dementia praecox who was for sixteen years in a mental hospital, where she died, aged 33 years. (Fig. F is a macroscopic drawing of the whole gland.) Note that the fibrous background is slightly thickened, that the cells are small, and that the nuclei are surrounded in some cases by a very small amount of cytoplasm, and in some cases none is present. The nuclei vary in size and in staining. (Magnification 450.)

FIG. 8.—Photomicrograph of a section of the medullary portion of the adrenal gland of a case of dementia praecox who was for two years in a mental hospital, where she died, aged 29 years, of tuberculosis. (A macroscopic drawing of this gland is Fig. G.) Note the coarse fibrosis and the cells, which are atrophied. Some of the nuclei have no surrounding cytoplasm. The nuclei show variation in size. (Magnification 450.)

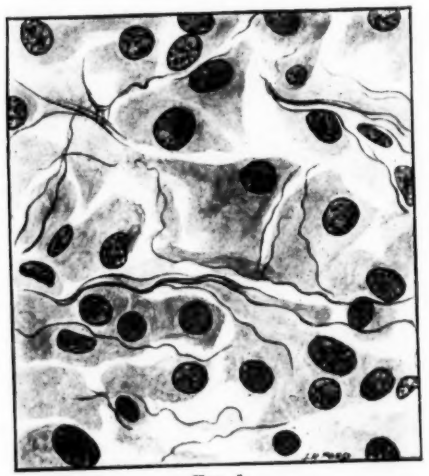

FIG. 1.

FIG. 2.

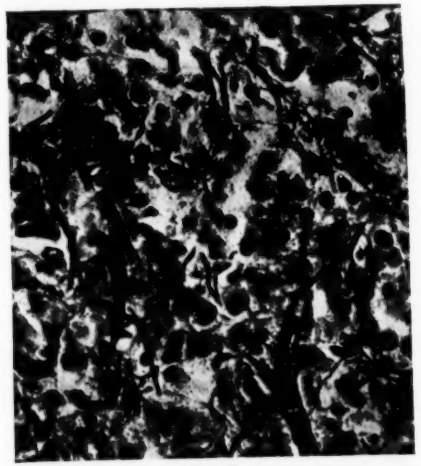

FIG. 3.

FIG. 4.

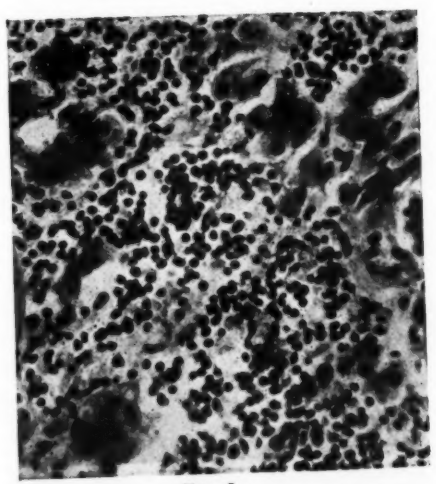

FIG. 5.

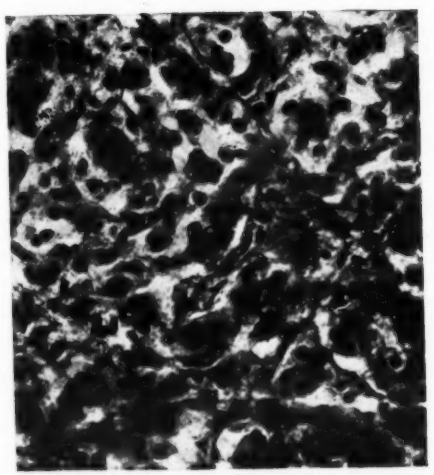

FIG. 6.

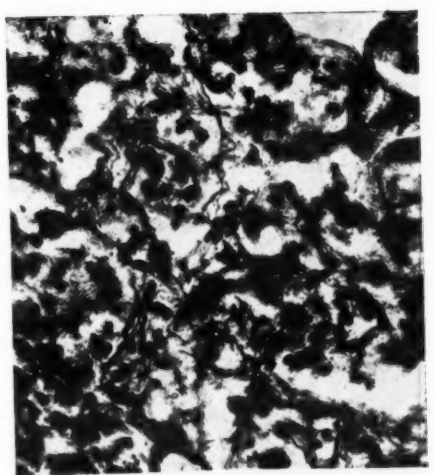

FIG. 7.

FIG. 8.

FIG. 1.—Microscopic section of an epi-articular ecchondrosis (1/6 in. obj.). The deeper layer of the cartilage is being invaded by inroads of vascular connective tissue from the subjacent bone. In these inroads are many multinucleated "chondroclasts."

FIG. 3.—Fibrotic synovial fringes in later stages of osteo-arthritis. No marked alteration in vascularity.

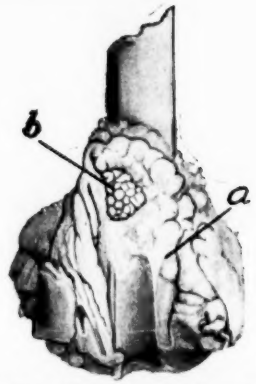

FIG. 5.—*Experiment II:* Experimental production of osteo-arthritis. One c.cm. of broth culture of streptococcus obtained from gums of case of osteo-arthritis injected into knee-joint of rabbit. Appearances after six weeks: *a*, commencing osteophytic growths; *b*, villosity of synovial membrane.

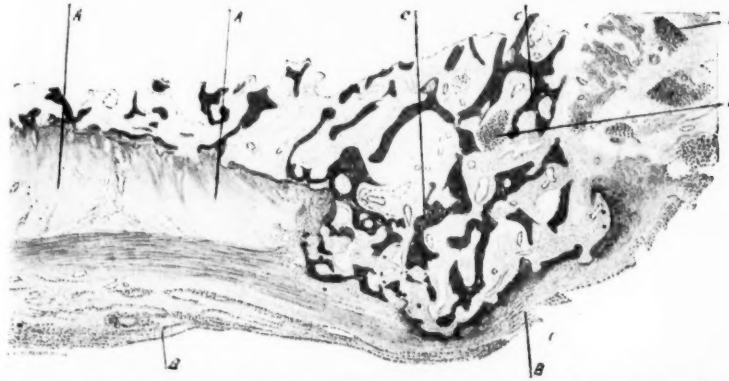

FIG. 6.—Drawing showing the typical appearances in chronic non-tuberculous arthritis of the synovial type (so-called rheumatoid arthritis). A A, Remains of the degenerate articular cartilage, in which many of the cell groups have undergone necrosis and the matrix is fibrillated in places. B B, Pannus of connective tissue derived from the synovial membrane which is spreading over the surface of the cartilage (A A), which it is invading and replacing. C C, Irruption of newly formed osseous tissue which has invaded the articular cartilage from below and joined forces with the afore-mentioned surface pannus. D D, Well marked areas of inflammatory small-cell infiltration, one of which occupies a cancellous space. See microscopic appearances of synovial membrane from this case (Fig. 7). From the knee-joint of a man, aged 45, upon whom synovectomy was performed through the author's patella-displacing approach.

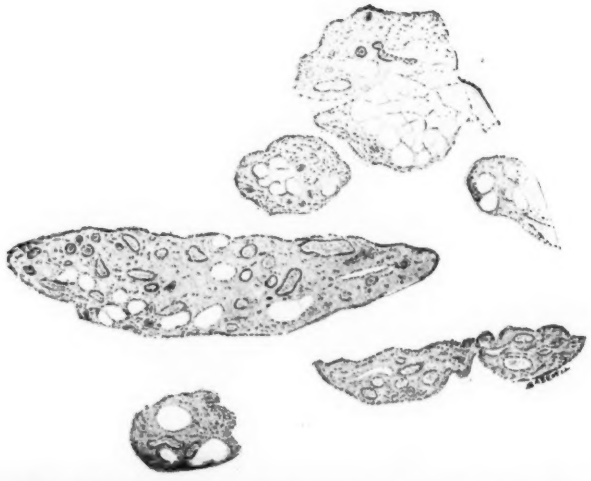

FIG. 2.—Synovial fringes from osteo-arthritic joint. Note vascular [illegible] infiltration in certain places. There is a complete

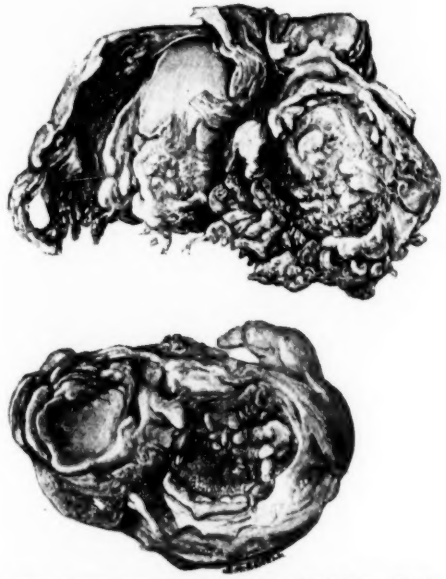

FIG. 4.—Tuberculous "osteo-arthritis." Parts removed by excision from a very chronic form of tuberculosis of the knee-joint in a young adult. The synovial membrane is markedly villous, and in places contains caseous nodules. Microscopic examination shows that these contain typical subsynovious giant-cell tubercle. The articular

FIG. 7.—Shows typical microscopic appearance of the synovial membrane in chronic non-tuberculous arthritis (rheumatoid arthritis) of synovial [illegible]. Reproduced collotypes

For many years before admission he was very abnormal mentally. The adrenals weigh 8.02 and 6.52 grams respectively. There is little contraction of the medulla, and here there is coarse fibrosis with a pericellular arrangement of the fibres. There is scarcely a cell to be seen, and not one that could be called normal. The nuclear changes are very advanced and the nuclear ratio in the medulla is high.

CASE IX.

C.; general paralysis of the insane. Male, aged 48 years at death, which occurred in a mental hospital where he had been for two years. The adrenals were markedly large and weighed 9.8 and 10 grams respectively. The medulla is not constricted and lipoid is present throughout. The medullary cells are normal in appearance and there is no fibrosis. The nuclei are normal and the nuclear ratio is low. Lymphocytic infiltration is present along the fibrous septa, and here and there are small clumps of lymphocytes.

CASE X.

Chronic tuberculosis. Female, aged 22 years at death. The adrenals weigh 6 and 5.5 grams respectively. There is no lipoid present except for a few droplets in the outermost layer of the zona granulosa. The medulla is not contracted and the cells are normal in appearance; the nuclear ratio is low. There is no fibrosis present nor any appearance of lymphocyte infiltration.

CASE XI.

V. B., single, aged 18 on June 12th, 1920, was charged with being drunk and disorderly, was sent to Holloway, and was certified insane on June 21st. She was admitted to the Manor on June 25th, and transferred to Horton on October 26th, 1920. Her mother stated that, as far as she knew, the girl was mentally sound up to about a week before certification. She was accustomed to take beer, generally on Saturday, and was described as a flower seller and afterwards a wardrobe dealer. She reached the sixth standard at school; one uncle was at Cane Hill, and another uncle died at Horton some years ago. In other respects the history was defective. On admission she was diagnosed as a case of adolescent insanity. She was very noisy, irrational, excited, rambling, and resistive; was strange in manner and became emotional and abusive; was violent and impulsive at times, and needed much supervision. Her physique and general health were good apart from a mitral murmur. On admission to Horton she was katatonic, destructive, and dirty. On December 11th, 1920, she had a profuse offensive vaginal discharge, but no gonococci were found. On January 10th, 1921, she had frequently relaxed stools containing blood and mucus, followed by obstinate constipation, and her general condition caused phthisis to be suspected. During 1921 she became progressively demented—dull, apathetic, with impulsive outbursts, and the symptoms of impairment of volition (negativism) continued. She was considered a typical case of dementia praecox. Her health again got worse, and on September 12th, 1922, she had pyrexia and relaxed offensive stools. The diagnosis of pulmonary tuberculosis had by this time been confirmed, and after becoming very emaciated she died on October 19th, 1922. *Post-mortem* examination showed pulmonary tuberculosis of both lungs with caseation and cavity formation. The ovaries weighed 3.4 and 3.2 grams; thyroid 8.3 grams; suprarenals 7 grams each. The most striking endocrine deficiency was in the thyroid gland. The suprarenal glands were of normal weight, and there was no obvious diminution of the medulla. Microscopic examination showed abundance of well formed cells; in many places there was a nuclear excess and polymorphism associated with deficiency of cytoplasm. Throughout the medulla there was a pretty general pericellular fibrosis. In this case—which was, relatively to most of the other cases of dementia praecox, of short duration—there was not much histological change in the medulla.

CORRELATION OF ATROPHOUS CHANGES IN THE INTERSTITIAL CELLS OF THE TESTIS AND THE ATROPHOUS CHANGES IN THE ADRENAL MEDULLA.

In a paper on "Further Pathological Studies in Dementia Praecox, especially in relation to the Interstitial Cells of Leydig" (Mott and Prados y Such) regressive atrophic changes were shown in the interstitial cells of twenty-seven cases of dementia praecox, the degree of atrophous change corresponding as a general rule to the length of time elapsing between onset of symptoms and death. Duration of asylum treatment does not strictly connote the length of duration of symptoms.

In nine cases of psychoses other than dementia praecox, death occurring in post-adolescence, similar appearances of regressive atrophy of the testes were found in those cases in which the psychosis was biogenetic in origin and terminated in dementia. Three cases of manic-depressive insanity without symptoms of dementia showed active spermatogenesis, but apparently a diminution of normal interstitial cells.

As a contrast to these regressive atrophic changes occurring in the biogenetic psychoses are the changes in the testes in cases of general paralysis due to local inflammatory lesions. The interstitial cells in this disease do not undergo the same regressive atrophic changes.

There is considerable similarity in the findings of the medullary cells of the adrenal glands and the interstitial cells of the testes. The normal medullary cells of the adrenals, like the normal interstitial cells, are polygonal in shape with a round nucleus; the cytoplasm in both is stained with eosin and presents a fine granular appearance. In the regressive atrophy of dementia praecox that occurs in both these tissues the cells lose their discrete outline, are smaller, have irregular crumbling edges, and tend to form a nucleated syncytium. The nuclei, instead of being a fairly uniform round shape and size, are more or less irregular in size and shape, and increased in numbers, and there is a lack of chromatin in many; especially the large pale irregularly oval shape nuclei appear to be deficient in chromatin. In both tissues there is a fibrosis and increase of fibroblastic nuclei.

Microscopic appearances indicate the continuous development of new interstitial cells of the testes, and new medullary cells of the adrenal, as in both instances mitosis was observable.

In both the atrophous interstitial cells and the atrophous medullary adrenal cells the failure of development of cytoplasm points to a probable failure of the mitochondria to develop. This failure of development may be correlated with a failure of secretion of the specific autacoid of these two glands.

In an acquired disease, general paralysis, the adrenal medullary cells do not as a rule show a deficiency of cytoplasm. In tuberculosis, another acquired disease, there is not any deficiency in the majority of cases dying in an advanced stage in consumption hospitals.

There is, therefore, a certain degree of correlation probable between the symptoms and their duration in dementia and the regressive atrophy of the reproductive organs, and the medulla of the adrenal gland. An investigation on similar lines, of the pituitary glands (shortly to be published), shows that there is a similar regressive atrophy of the cytoplasm, and nuclear changes of the cells of the anterior portion of the gland. An investigation of the thyroid gland is in progress on similar lines. But what is required now is an intensive clinical and laboratory investigation of the whole reproductive endocrine glands and sympathetic system in the various types of mental disease. These generalized researches on a large number of cases should be followed by an intensive study of individual cases, to correlate if possible clinical signs and symptoms with pathological findings. (F. W. M.)

Conclusion.

The most constant change which is found in the medulla adrenalis in dementia praecox is, then, the increased number of nuclei, irregularity of their size and form, and deficiency of chromatin. There is, moreover, an increase of fibrous tissue which often takes a pericellular arrangement and an increase of fibroblastic nuclei. In tuberculosis there may be a great diminution of cytoplasm, but these nuclear changes are not seen. In general paralysis the nuclear change is not observed and the cytoplasm as a rule is not affected to any extent.

We wish to express our great indebtedness to Mr. Chas. Geary for his skilled assistance in making the microscopic sections and the photomicrographs.

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THE NATURE OF THE SO-CALLED RHEUMATOID ARTHRITIS AND OSTEO-ARTHRITIS.

SUMMARY OF AN INVESTIGATION INTO THE PATHOLOGICAL CHANGES, WITH A PLEA FOR A SCIENTIFIC CLASSIFICATION.*

(With Special Plate.)

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THE chronic forms of arthritis known in this country by the somewhat unscientific names "rheumatoid arthritis" and "osteo-arthritis" are among the commonest of all human ailments, and probably cause a greater loss of productive energy to the community than disease of any other system. It is true that the disease rarely, if ever, causes the death of the patient, but it often occurs in the comparatively young and active, to whom the resulting crippledom is a grave hardship. It is proposed in this paper to resist the temptation to discuss clinical aspects and treatment, and to review briefly certain aspects of the problem.

A. UNDERLYING REASONS FOR THE PRESENT STATE OF THE ARTHRITIC PROBLEM.

1. *Ignorance of the Physiology of the Articulations.*

It is a striking fact that until quite recently our ignorance of some of the most elementary facts concerning the articular cartilage and the functions of the synovial membranes and fluid was almost mediaeval. Claude Bernard wrote more than half a century ago with regard to the synovial fluid: "les données physiologiques sur ce liquide sont a peu près nulles: le siège anatomique de sa sécretion est lui-même très peu connu." It is somewhat of a reproach that these words are wellnigh as true to-day as when written. Even otherwise exhaustive treatises on physiology either ignore the subject altogether or dismiss it in a few lines as one of minor importance. My own halting and imperfect efforts in this realm will be briefly touched upon below.

2. *Ignorance of Normal Intimate Histological Structure.*

There exists great variance of opinion concerning the histological structure of articular cartilage and synovial membrane. With regard to the former, some hold that a perichondrium is present over the whole surface, others that it is present at the periphery only; while another school, following Ogston, hold that the superficial cells are in reality degenerate, and are in process of being cast off into the joint. With regard to the synovial membrane, hardly any two authorities agree as to the nature of the cells with which it is lined. In regard to its connexions, Schafer states "they are not connected with the lymphatic system;" but by injecting colloidal silver solution into the knee-joint of a living animal I was able to show that absorption by the lymphatics definitely occurs.

When faced with such multiplicity of views it would appear sufficiently obvious that the course to adopt is not to argue but to look and see. This is the method I adopted, and what I saw has been described by me in a recent Hunterian Lecture upon osteo-arthritis. Some of the main points will be briefly enumerated below.

3. *Ignorance of the True Nature of the Pathological Changes.*

It is clear that before we can hope to treat any disease on rational lines we must have a clear conception of its essential nature.

At the outset we are faced with contradictory views. For instance, Goldthwait christened the two groups, which we in this country usually call rheumatoid arthritis and osteo-arthritis, as atrophic and hypertrophic arthritis respectively. Nichols and Richardson, however, classify them into proliferative and degenerative arthritis. Thus the condition that we know as osteo-arthritis is interpreted by the former as a process of hypertrophy and by the latter as a degenerative process. Some may say, "This is very interesting, but how does it help the unfortunate sufferer?" I would reply that it is of fundamental importance in prognosis and treatment. If we accept the view that the disease is some form of degeneration having an obscure relation to old age, it is difficult to see how treatment can be of any avail or how the disease can be arrested. If, however, we accept the view that the disease is inflammatory in nature, it is clear that the disease assumes an entirely different complexion, and that we should not leave a stone unturned until we have discovered the source of the toxic substances that bring about these inflammatory changes. Moreover, like other inflammatory processes, they may come to a natural termination. Instead of a depressing policy of *laisser-faire*, we adopt a more active and cheerful outlook. I have known individuals who have been labelled "senile" arthritis of the hip converted from lives of painful crippledom to an active and comparatively painless existence. I propose to give a short description below of my conception of the nature of the changes.

4. *A Confusing Nomenclature.*

One of the commonest mistakes in this connexion lies in the investigator endeavouring to form a primary classification according to his conception of the *nature* of the pathological changes. Owing to the diversity of the latter confusion is bound to ensue. Another common error lies in mixing anatomical, clinical, and pathological subdivisions in the same classification. A good example of this lies in the terms "osteo-arthritis" and "rheumatoid arthritis." The former name is given owing to the supposed site of the principal changes, and is therefore anatomical. The latter term is a pseudo-clinical term in which the disease is compared, in terms reminiscent of the humoral pathology, to yet another disease, the etiology of which is still unsettled.

5. *Lack of Co-operation between Physician, Surgeon, and Pathologist.*

Specialism has its advantages, but we should never lose sight of its drawbacks and dangers. The policy followed at present is to divide many diseases into more or less arbitrary stages—the domain of the physician and surgeon respectively. Such divisions are obviously illogical and unnatural, and are among the most serious impediments to progress with which we are faced. We see the same lack of co-operation between physician and surgeon in the treatment of such conditions as gastric and duodenal ulcer. If we are to have specialists, let us have those who will make a thorough study of a system or organ and be responsible for the treatment of its disorders from beginning to end, whether operative or non-operative.

The surgeon's share consists very largely in dealing by operation with the failures of medical treatment. The last twenty years have seen a great development of elaborate surgical technique; but I believe and trust that before the present century terminates we shall see a more healthy co-operation between physician and surgeon in the direction of the *prevention* of those advanced states that at present demand operation.

Sir Robert Jones has with great courage frequently protested against the existing lack of co-operation, and, thanks largely to his efforts, there has undoubtedly been improvement. It is unfortunately still only too common to meet with gross deformities which should never have been allowed to occur; and, on the other hand, for individuals to endure unnecessary pain and suffering because the physician has not acquainted himself with the possibilities of surgical measures in overcoming deformity or in restoring movement to the stiff joint. At the special Ministry of Pensions clinic at Orpington such co-operation exists, and the results, which have been most gratifying, lead one to believe that an extension of such clinics in civil life would be of great advantage.

* The expenses of this research were defrayed by the Medical Research Council, to whom my thanks are due.

B. THE ESSENTIAL NATURE OF THE SO-CALLED RHEUMATOID ARTHRITIS AND OSTEO-ARTHRITIS.

It is not my intention to describe in detail the pathological changes, since those occurring in osteo-arthritis have been described in detail by me elsewhere,[1] and the changes in rheumatoid arthritis have been described by many competent observers, particularly Nichols and Richardson and Strangeways. We have already seen that the pathological processes have received interpretations of an extraordinarily varied nature. Hence I propose to discuss shortly the true nature of the changes in the common types of chronic arthritis.

In the first pathological type, as Virchow pointed out, the disease commences in the central area of the articular cartilage and is associated with early "lipping" of the articular margins, although in rare cases this is absent. The synovial membrane is involved comparatively late, and never to the same degree as in the second type. This type of arthritis is known in this country by the name "osteo-arthritis." The well marked bony thickening with only slight changes in the synovial membrane and absence of "spindle-shaped" appearance of the joint, together with the usual moderate severity of the symptoms, form a well marked clinical picture. The earlier changes are very commonly seen *post mortem* in the joints of those who have passed the meridian of life.

In the second pathological type the process commences and remains more marked in the synovial membrane, and the articular cartilage is often, but not necessarily, invaded from the periphery. The formation of chondro-osteophytes, producing "lipping," is occasionally seen in the more chronic stages of the disease, but, as a rule, to a lesser degree and at a later stage than in osteo-arthritis. Pain and muscular spasm are more marked in this type and contracture deformity is common in neglected cases. This type of arthritis is known in this country by the name "rheumatoid arthritis."

In the third pathological type the process appears to start simultaneously in the synovial membrane and articular cartilage, and the change advances *pari passu*. Although borderland cases sometimes occur, usually there is not much difficulty in determining with which type we are dealing. It is clear that both pathologically and clinically these types, particularly the first two, have well marked distinguishing features.

TYPE 1.—*Chronic Arthritis in which the Disease Commences in the Articular Cartilage (Osteo-arthritis).*

The first departure from the normal consists, to the naked eye, in an alteration in colour of the surface of the central area of articular cartilage, which loses its normal bluish-white translucent appearance, and becomes more opaque and of a yellowish hue. Microscopically there is an alteration in the staining reaction of the matrix; for instance, with eosin the superficies stains very faintly compared with the deeper layer of the cartilage. There is at this stage no alteration in the cartilage cells. At a slightly later stage the so-called "fibrillation" of the matrix occurs at the surface of the central articular area. In a sense the term "fibrillation" is a misnomer, as there is no formation of true connective tissue fibre, but a mere splitting of the matrix. This appearance of fibrillation, as I have endeavoured to point out, is due to the peculiar structure of the matrix. If articular cartilage be steeped in brine for several days it will be seen that the matrix is arranged in alternating lamellae which lie horizontally in the superficial layers, form an irregular network in the intermediate zone, and constitute a palisade of vertical strata in the deeper layer. Histological examination shows that these alternate layers are formed by the more collaginous and the more mucinous elements of the matrix respectively. I believe that articular cartilage is nourished by lymph which percolates along these tracks, particularly the softer, more mucinous. I have little doubt also that the fibrillation is often due to the solution of the more mucinous tracks by toxic substances contained in the synovial fluid, whereby the more resistant collaginous elements remain as the so-called "fibres."

Now let us glance at the behaviour of the cartilage cells at this early stage. Occasionally the cells at the extreme surface undergo degenerative changes. The most striking fact, however, is that in most cases the cells exhibit no sign of diminished vitality, and very often groups of actively proliferating cells may be seen. It is very striking, even in advanced cases, to see the "fibres" containing groups of healthy proliferating cartilage cells. A still more important point is that the most active proliferation occurs at the margins of the clefts in the matrix. This viability and active proliferation of the cartilage cells appears to me to be the very antithesis of an atrophic or degenerative process, at any rate as far as the cells are concerned. To me it seems fairly evident that the cells proliferate in response to irritation. We thus see that, as far as the central area of the articular cartilage is concerned, the change consists in a degenerative process in the cartilage matrix with proliferation of the cellular elements.

Shortly afterwards, or coincident with the above changes, the well known "lipping" of the articular margin occurs. This is caused by proliferation of the lateral part of the articular cartilage and of the underlying bone. As there is actual formation of new bone and cartilage cells, the term "hypertrophy" is a misnomer; but to regard the process as a pure degeneration is absurd. Later the cartilage on the surface of this new formation may undergo the same changes that we have seen to occur in the central area. As the cartilage disappears the subjacent bone becomes sclerosed from compensatory new bone formation. The deeper layer of articular cartilage is also invaded by vascular inroads of connective tissue which form new bone. The surface may thus be rendered hummocky—the epi-articular ecchondroses of Shattock (Fig. 1). The subjacent cancellous spaces are often of unusually open texture, due to a process of rarefying osteitis, and occasionally cyst-like spaces are in evidence. Some of these, I believe, may be due to cystic degeneration of islands of articular cartilage which have become isolated by the advancing tide of new bone formation.

Changes in the Synovial Membranes and Capsule.

For a considerable period no obvious changes may be seen in the synovial membrane, but eventually the portion of the membrane nearest to the articular margin becomes more villous. There is a hyperplasia of all its elements with occasional areas of small-cell infiltration, but the latter are rare compared with the second type, in which they are a prominent feature. Newly formed blood vessels are conspicuous, and show no evidence of arterio-sclerosis at this stage (Fig. 2).

During this stage of increased vascularity there is sometimes a development of adipose tissue, cartilage, or bone in the synovial membrane, but never to the same extent as in the second type. This increased vascularity and cellular proliferation strongly negative the primarily degenerative or atrophic view of the disease. The fact that the synovial fluid is usually not deficient in nutritive qualities is shown not only by my analyses, but by the fact that synovial chondromata and periarticular chondro-osteophytes may become detached and continue their growth while free in the joint. In the later stages the membrane and capsule may undergo sclerosis (Fig. 3); and with Hoffa and Wollenberg I have observed the occasional presence of areas of hyaline degeneration. Arterio-sclerotic changes may be seen in certain of the vessels of the synovial membrane, yet it is clear that these vascular changes advance *pari passu* with the changes in the membrane. It is also clear that they are not of etiological importance, but are coincident, and, like the changes in the membrane, inflammatory rather than degenerative.

Dr. Geoffrey Evans, in his recent investigations into the nature of arterio-sclerosis with special reference to its relation to chronic renal disease, has brought forward evidence that the latter is usually inflammatory in nature, as is also the coexistent arterio-sclerosis—that the latter is not of etiological import, but that both conditions are probably due to the same cause. The author and Dr. Evans have arrived at similar conclusions concerning the etiological importance of arterio-sclerosis through different avenues of approach.

Traumatic Osteo-arthritis.

This type deserves a few separate words. It is a purely localized form, in which the central part of the articular cartilage undergoes the changes that we have already enumerated owing to its being exposed to an undue degree of mechanical trauma or stress acting over a long period. Sir Arbuthnot Lane has rendered a great service by pointing out that this type is not a disease, but rather the series of compensatory changes that occurs in a joint in response to altered stress. This type, as Lane pointed out, is often occupational.

The nature of the pathological changes in osteo-arthritis supports the view that these changes are the response of the joint structures to irritation, either mechanical or toxic, and are inflammatory in nature; that these changes are both degenerative and proliferative, both processes often advancing *pari passu;* that the different reaction to the cause may largely be accounted for by the fact that the lateral articular area is better nourished than the central.

The theory of general diminished nutrition of the joint structures is negatived by the proliferation—often marked—that occurs, and by analysis of the synovial fluid; moreover, arterio-sclerosis is probably not of etiological importance. Proliferative changes also negative the theory that the process is one of atrophy due to old age. Hence such a term as "morbus coxae senilis" is a misnomer. I venture to give the following definition: Osteo-arthritis does not constitute a disease *sui generis*, but rather the series of physiological or pathological changes that ensue in a joint when it is subjected to prolonged or oft-repeated injury, either mechanical or toxic, but of a moderate degree of intensity. The causes are therefore very varied, and there can be little doubt that the future will bring to light additional factors in its causation of which we are at present ignorant. Osteo-arthritic changes, for example, occur with greater frequency in certain disorders of the ductless glands, such as acromegaly, than can be ascribed to mere coincidence. Whether in these cases the joint changes are due to the action of toxins formed from failure of the ductless gland to supply the necessary link in the chain of metabolic endogenous products, or whether in some way the resistance of the joint to bacterial toxins is lowered, it is impossible at present to state.

The relation of osteo-arthritis to the group of auto-intoxications due to defects in the excretory apparatus or to the accumulation in the body of products of normal metabolism is still undecided, but two groups emerge concerning the etiology of which we have a little more evidence. The following preliminary classification is therefore adopted: Group 1, traumatic osteo-arthritis; Group 2, osteo-arthritis due to bacterial toxins. Examples of Group 2 are well seen after many infective forms of arthritis. It is not generally recognized that the condition may occur in certain chronic types of tuberculous disease (Fig. 4). I have also succeeded in producing an infective type of osteo-arthritis experimentally[2] (Fig. 5).

TYPE 2.—*Chronic Arthritis in which the Disease Commences in the Synovial Membrane* (*Rheumatoid Arthritis*).

Clinically every stage of acuteness may be seen, from the subacute polyarticular or monarticular, in which pain or spasm are so marked that deforming contractures are liable to develop, to the more common type, also polyarticular or monarticular, in which spasm or pain are less marked features, and therefore limitation of movement is less likely to accrue. Different types are also seen, which have been so carefully described by Nichols and Richardson in America and by Strangeways in this country that I do not propose to discuss them in detail.

Some little confusion has, however, been produced by the introduction of the term "atrophic." For it is now almost generally recognized, save by those who "have eyes and see not," that the process is primarily of a pronounced inflammatory nature, and that when atrophy occurs this may be largely accounted for by disuse. As in osteo-arthritis, however, degenerative changes may accompany the proliferative. These may be seen, for example, in the articular cartilage, and the latter is often for this reason invaded and replaced by a pannus of granulation tissue derived from the synovial membrane and by ingrowths of vascular connective tissue from the subjacent cancellous spaces (Fig. 6). In the more chronic forms there may be no pannus, but mere fibrillation of the cartilage. This absence may be due to the movements of the patient which are possible owing to the less severe nature of the pain, and which militate against the progress of this tide of granulation tissue. In the synovial membrane inflammatory collections of small round cells in the vicinity of the vessels are prominent features (Fig. 7). As in the first type of arthritis, adipose tissue, cartilage, or bone may be developed in the synovial fringes. Periarticular lipping certainly occurs, although somewhat later than in the first type of arthritis. I believe it to be Nature's way of endeavouring to extend the articular surface, and is therefore more commonly seen in the more chronic cases where movement has been continued and sclerosis and contracture have not occurred.

C. SOME PHYSIOLOGICAL FACTORS UNDERLYING THE PATHOLOGICAL PHENOMENA.

I believe that the extraordinary difference between the behaviour of the central and lateral articular areas in these chronic forms of arthritis can be explained by a principle that I have endeavoured to establish—namely, that the lateral part of the articular cartilage is better nourished than the central, and is, moreover, furnished with a perichondrium in which lie blood vessels derived from the circulus articuli vasculosus. The central poorly nourished area responds to the cause of osteo-arthritis by degeneration, whereas the lateral part proliferates. It is possible that pressure may play a rôle—although I believe a minor one—in causing the different reaction. I found, on examination of a considerable number of cases of osteo-arthritis of the knee-joint, that in nearly every case the changes commence in the central articular areas of the patella and trochlear surface of the femur, and *not* where pressure is greatest upon the femoral and tibial condyles. The phenomena of repair of articular cartilage confirm the view of its nutrition. I was able to produce experimentally a traumatic form of osteo-arthritis by the simple expedient of removing the central part of the articular cartilage, when compensatory proliferation of the better nourished lateral area occurred, producing characteristic "lipping."[3]

It is instructive to study the appearances seen in cases in which a simple transverse fracture of the patella has occurred some years previously and in which the fragments have maintained good apposition. It will usually be seen that firm bony union is present; that there is usually no repair of the breach in the central part of the articular cartilage, but that the breach in the lateral portions on either side has been repaired. The adjacent articular cartilage is almost invariably fibrillated. It is probable that the condition we designate "traumatic osteo-arthritis" is in reality a physiological rather than a pathological process.

D. SUGGESTED SCIENTIFIC NOMENCLATURE.

We have already criticized some of the existing nomenclatures and offered the opinion that any attempt to classify the forms of chronic arthritis according to the supposed *nature* of the pathological changes is, owing to the complexity of the latter, undesirable.

Clinical or pseudo-clinical classification leads to great confusion. A satisfactory classification must fulfil the following requirements: it must be simple, scientific, and accurate, and non-reminiscent of mediaeval empiricism. Let us hope that an era will soon dawn when "rheumatism," "rheumatoid," and allied terms will be banished from scientific language. I suggest that the term "chronic arthritis" is simple, scientific, and accurate, since it indicates its inflammatory nature. How, then, are we to differentiate the various types? I suggest that the differentiation should be according to the site of origin, which is also the anatomical site of the principal changes. I may, perhaps, attempt to tabulate as follows:

Suggested New Nomenclature.

Chronic Arthritis (A, Monarticular; B, Polyarticular).

(1) *Synovial Type* (O.T., Rheumatoid arthritis).—The disease commences and remains more marked in the synovial membrane. The cartilage and bone may be invaded secondarily. Every gradation may be seen between the chronic types and the more acute forms which lead to ankylosis.

(2) *Chondro-osseous Type* (O.T., Osteo-arthritis).—The disease commences and remains more marked in the articular end, the synovial membrane being involved later.

(3) *Mixed Type.*—The disease commences simultaneously in synovial membrane and articular end and the changes advance *pari passu.*

In all three types osteophytes may form at the articular margins, but in the synovial type they occur comparatively late in the disease, and in the more acute forms which lead to ankylosis are usually absent. The suggested nomenclature is obviously a primary classification. It is probable that further research will justify us in subdividing each type.

E. THE NEED OF RESEARCH INTO ETIOLOGICAL ASPECTS.

Clinical evidence often appears to point to an infective or toxic origin in many cases of chronic arthritis. In a certain proportion obvious infective foci are present, the treatment of which may produce amelioration or cure of the joint condition. In other cases a careful search fails to reveal any primary focus, but it should not be forgotten that this fact by no means negatives the possible infective nature of the disease. For instance, chronic polyarticular arthritis may be ushered in by an attack of tonsillitis. The latter may entirely subside; yet the arthritis remains, and the supposition is that micro-organisms have entered the circulation via the tonsil and have settled in the synovial membrane, where they proliferate and form their toxins.

A young man came under my care suffering from chronic gonorrhoea with gleet. Gonococci were present in the prostatic smear. While under treatment he developed a spindle-shaped swelling of the interphalangeal joints of the hand exactly similar to rheumatoid arthritis. At this stage, however, examination of prostatic smears for organisms was persistently negative. The infective nature of his arthritis was therefore obvious on clinical grounds, although it could not be demonstrated bacteriologically.

Similarly in tuberculous disease of a joint the primary focus is usually a matter of assumption rather than actual demonstration. It is clear that any possible primary focus should be treated not only for these special reasons but because thereby the general health of the patient is improved.

At the same time we must bear in mind that the treatment of the primary focus need not necessarily bring about the desired result if the organisms were already entrenched in the synovial membrane and joint structures, as on clinical and bacteriological grounds sometimes appears to be the case. In these cases the treatment applied to the joints themselves is of even greater importance than concentrating on primary foci. How often the efforts of the medical man are devoted to the latter while the joints are allowed daily to become more stiff and deformed—an excellent example of a policy of "straining at a gnat and swallowing a camel."

The bacteriological aspects of the problem are clamouring for complete and scientific investigation. The important pioneer work of Blaxland and Poynton and Paine requires following up. From time to time bacteriological investigations of the synovial fluid have been made and have been usually negative. However, as an argument against the infective nature of these forms of chronic arthritis this fact is quite valueless; for we know that in the form of chronic arthritis occurring in such infective conditions as gonorrhoea the fluid is usually sterile. What is required is examination of the synovial membrane and other joint tissues. The extent of the operative field in chronic arthritis has increased of late years, and if every surgeon would make a point of having all tissues removed from the joint systematically examined by a bacteriologist the evidence obtained might be of great value. This is one line upon which my own investigations are now proceeding.

In conclusion, let me repeat that the stage is now set for the bacteriologist and chemical pathologist in conjunction with the surgeon to march forwards, inspired by the immortal advice of John Hunter to Jenner, who was "thinking" of investigating vaccination: "Do not think but try: be patient, be accurate."

It is my pleasant duty to thank all those who have assisted me in my researches. To Sir Arthur Keith I am indebted for permission to work at the Royal College of Surgeons of England and for much help. Professor Shattock has been ever ready with advice on pathological points. To my colleagues at the hospitals with which I am connected, and especially in the Medical and Surgical Units of University College Hospital, I owe a debt of thanks.

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A CASE OF FEVER DUE TO B. PARATYPHOSUS C.

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PARATYPHOID C fever appears to be rare in England, and only two previous cases have been described—one by Dudgeon and Urquhart (1920) and another by Andrewes and Neave (1921). Possibly the disease is commoner than is imagined, but in many cases (as pointed out by Dudgeon and Urquhart) agglutinins are not formed in the blood, and often the diagnosis can be made only by isolation of the organism from the blood stream, or more rarely from the faeces.

A girl, aged 13½ years, was under the care of Dr. Benson Young of Plymouth, to whom I am indebted for the clinical particulars. She had had the symptoms of a mild "influenzal" attack for three to four days—temperature 100° F., pulse 120, cough, sweating, and joint pains. The temperature steadily rose, until seven days after the onset of the disease it was 106° F., pulse 124. The patient was semi-delirious, the tongue furred and dry; there were scattered areas of consolidation over the lungs, and slight diarrhoea was present. The spleen was not enlarged and no spots were noted.

At this stage I saw the patient in consultation with Dr. Young. A blood count gave the following figures: Leucocytes 4,440 per c.mm., polymorphs 54 per cent., lymphocytes 44 per cent., large hyalines 2 per cent. Agglutination to *B. typhosus* and *B. paratyphosus* A, B, and C was negative in a dilution of 1 in 25. The urine contained no pus and was sterile on cultivation. No pathogenic organisms were isolated from the faeces. From the blood a Gram-negative bacillus was isolated which gave the reactions of *B. paratyphosus* B with the exception that dulcite was not fermented. On subculture, however, acid and gas were produced from dulcite, though this took about seven days. Acid and gas were also produced in dextrose, maltose, mannite, and xylose; no change was produced in inosite (unlike *B. paratyphosus* B); an alkaline reaction was produced in litmus milk.

The organism was tested with some *paratyphosus* C serum kindly sent me by Professor L. S. Dudgeon. It was agglutinated to the end point of this serum, whereas with *paratyphosus* B serum, with an end point of 1 in 8,000, agglutination only took place up to a dilution of 1 in 400. On saturation of this stock *paratyphosus* C serum with the bacillus isolated from the patient the following result was obtained.

The titre of stock *paratyphosus* C serum before saturation with the patient's bacillus on its homologous antigen was 1 in 8,000. The titre of the above serum after saturation with the bacillus isolated from this patient on the same antigen was 1 in 100 = trace; 1 in 200 = 0. Although the patient's serum did not agglutinate the stock *paratyphosus* C antigen, her own bacillus was agglutinated slightly (1 in 100, trace) by her own serum.

Course of Illness.

The temperature slowly subsided and was normal in ten days from the onset of the disease. No complications ensued. The pulse throughout was high; it was over 120 during the first week of illness, and a fortnight elapsed before it was below 100.

Frequent examinations were made of the faeces, using both the brilliant green enrichment method, direct plating, and the method of drying (Wordley, 1921); in no instance was *B. paratyphosus* C isolated. Fourteen days after the first agglutination was performed the patient was again bled and her serum tested on *paratyphosus* C antigen, with a negative result.

The source of infection was not discovered and no other cases of unexplained fever arose. The faeces of the other members of the family were examined, but no pathogenic

organisms were isolated. As a precaution the other inmates of the house were inoculated with a *paratyphosus* C vaccine, and, as stated above, no fresh cases of infection arose.

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THE RELATIVE CONCENTRATION RATIOS OF SOME CONSTITUENTS OF THE URINE.

*(Abstract.)**

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THE "filtration-reabsorption" theory of renal secretion states that the glomeruli filter off from the plasma its dialyzable constituents, some of which are reabsorbed, together with water, by the tubules, thus leading to a concentration of the remainder: the former are described as "threshold," and the later as "no-threshold" bodies respectively.[1] If two "no-threshold" substances are present together in the plasma, are filtered off by the glomeruli, and are concentrated in the tubules by the absorption of water, the degrees to which they are concentrated should be the same in each case. The "concentration ratio" is the ratio of the amount present in the urine to that in the plasma (expressed in percentages).[2] The experiments to be described were performed to determine the relative concentration ratios of some of the so-called "no-threshold" constituents of the urine; urea, inorganic phosphate, and creatinine were chosen for this purpose. They are present in a "free" (that is, dialyzable) condition in the plasma, and appear to be equally distributed between plasma and corpuscles *in vivo*, so that estimations made on the plasma give the amounts available for filtration through the glomeruli at that moment. As, however, it has been stated that urea and inorganic phosphate are present solely in the plasma *in vivo*, entering the corpuscles after the blood is shed, unless precautions are taken to avoid injury to them,[3] some preliminary experiments were performed on the distribution of these three substances between plasma and corpuscles in the blood of the cat, since this animal was used for the later experiments. It was found that urea and creatinine were evenly distributed under normal conditions: after injection intravenously, the same even distribution might be found, or there might be more in the plasma, while there was always more inorganic phosphate in the plasma than in the corpuscles after it had been injected into the blood stream.

The experiments on the concentration ratios were performed on decerebrate cats: a solution of the substances about to be examined was injected intravenously, a blood sample taken shortly afterwards, and a further sample after a variable length of time, during which the urine was collected; in some experiments further samples of blood and urine were obtained. The blood samples were oxalated and centrifuged, and the plasma used for the analyses. For calculating the concentration ratio the plasma percentage was taken as the mean of the analyses of the two samples obtained at the beginning and end of the period during which the urine was collected.

It was found that the creatinine was always concentrated to a greater extent than the urea—from two to five times more in the different experiments. This occurs whether the plasma or urinary concentrations vary or remain constant during the course of an experiment. The fact that the results obtained when the plasma concentrations are constant are comparable with those obtained when these concentrations vary, suggests that taking the mean plasma concentration for calculating the concentration ratio introduces no appreciable error.

Comparing the concentration ratios of inorganic phosphate and urea, it was found that the phosphate might be concentrated to about the same extent as the urea, or up to about three times more; but it was always found to be concentrated to a less degree than the creatinine in the same experiment. The degree of concentration seemed to depend directly on the amount of phosphate injected, being greater when the kidney had to remove a larger amount from the blood stream. If the concentration ratio of urea is taken as unity, those of creatinine and inorganic phosphate relative to this as standard can be plotted on a chart, and it is seen that there is a general parallelism between the ratios of the latter two, which possibly depends on the rate of blood flow through the kidney.

The fact that urea, inorganic phosphate, and creatinine may be concentrated to different degrees by the kidneys during excretion is difficult of explanation on the filtration reabsorption hypothesis. If the modification be accepted that the urea is partly reabsorbed in the tubules,[4] these experiments show that the hypothesis must be still further modified to admit of partial reabsorption of the inorganic phosphate also. It seems more probable that the tubule cells secrete these substances independently, according to the requirements of the moment. On the other hand, the facts are consistent with the view that selective reabsorption takes place in the tubules, the fluid absorbed varying in composition at different times. A fairly definite relationship was found between the excretion rates of the three substances in experiments in which several samples of urine were obtained: the factor correlating the excretion rates is presumably the blood flow through the kidney.

The experiments give data for calculating the rate of disappearance of the injected substances from the blood stream, taking the initial blood volume to be 5 per cent. of the body weight. Within two minutes of the completion of the injection, 75 to 90 per cent. of the injected urea and creatinine is no longer to be found in the blood; the loss is most rapid at first, and then the rate slackens until a balance is struck between the concentrations in the blood and in the tissues; the concentration in the blood may now remain fairly constant in spite of excretion in the urine, since the tissues act as a reservoir of the substances in question. The injected inorganic phosphate leaves the blood more slowly, and only about 65 to 80 per cent. disappears into the tissues.

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[1] Cushny: *The Secretion of the Urine*, London, 1917. [2] Maclean: BRITISH MEDICAL JOURNAL, 1921, ii, p. 425. [3] Falta and Richter-Quittner: *Biochem. Zeitschr.*, 1921, 114, p. 145. [4] Mayrs: *Journal of Physiology*, 1922, 56, p. 58.

* The full paper is published in the *British Journal of Experimental Pathology*, 1923, vol. 4, pp. 87 and 117.

THE DIFFERENTIAL DIAGNOSIS OF SMALL-POX AND CHICKEN-POX.

OBSOLETE DIAGNOSTIC CRITERIA.

BY

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ANYONE who wishes to gain a really sound grounding in this subject will be well advised to assign beforehand their true value to certain traditional criteria with which he may have been equipped as a student. There are certain phenomena which frequently occur indeed, but are not pathognomonic in the hour of trial for the purpose of distinguishing between small-pox and chicken-pox. Into this category fall umbilication, shottiness, palatal and buccal lesions, lesions on the sole of the foot, cropping, uniloculation. Not one of these is a real friend in need; and the first four may prove to be very unreliable in the matter of the assistance which they offer.

In my article in the Jenner Memorial Number of the BRITISH MEDICAL JOURNAL, dated July 5th, 1902, on "The differential diagnosis between variola and varicella," the following observations were made: "It is well at once to say that the words 'shotty' and 'umbilicated' are mere broken reeds to lean upon in the matter of diagnosis. The expressions are pernicious in two ways: Their absence in a case suspected to be small-pox is taken as evidence against that disorder, and their presence in a case otherwise suggestive of varicella is held to negative that disease. The words are fetishes, or objects of superstitious worship which help their devotees as little as do most idols, and

mislead them far more. They should be treated as such and discarded. In the differential diagnosis of small-pox there are no more fertile sources of error."

Twenty-one years have run by since those words were penned—years constantly spent in consultations upon the numerous remarkable examples of cases simulating small-pox which a metropolitan area and its neighbourhood can show, drawn as they are from a population of about 8,000,000 persons of all grades, classes and races; and this experience has emphasized the general truth of the above mentioned comment. That comment applies in fact to all six of the above-mentioned points. There is this much to be said by way of modification: in proportion as the newer criteria are coming to be known as being more reliable, so less is now heard than formerly of shottiness and the rest.

Once more it must be said that there is no royal road, no beaten track, no measuring tape or touchstone, which will infallibly rescue the perplexed. Any case under review should be cross-examined, so to speak, on four main points: (1) What is the distribution, general and local? (2) What is the degree of prostration? (3) What is the depth of the lesions in the skin? (4) What is the rate and manner of maturation of the lesions?

The whole of the evidence must then be summed up and the verdict given accordingly.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

DYSTOCIA DUE TO SHORTENING OF UMBILICAL CORD.

THIS interesting complication of labour occurred in a case in Belfast Union Maternity Hospital. The patient, a primipara, was admitted to hospital at full term. The foetus was in first vertex presentation, but the head was very freely movable above the brim. As she was a small woman contracted pelvis was suspected, but the pelvic measurements were found to be normal and no obstruction of any kind could be found, nor did the head seem abnormally large. The only thing noticed out of the ordinary was a very distinct funicular souffle.

Labour came on next day, and after the cervix was fully dilated the head still remained at the brim. My house-surgeon applied forceps tentatively, and at first could not get the head to advance materially. Suddenly a loud snap took place, which was heard by nurses at the side of the bed, and after that the head advanced easily enough, a little bleeding taking place continuously. On delivery the cord was found to be twisted round the neck of the child, and was completely torn through about three inches from the umbilicus. The child of course was stillborn, but the mother made a normal recovery.

Evidently the foetus was suspended in the liquor amnii by the shortened cord, which prevented the head from engaging or advancing after labour started. The placenta followed the foetus very quickly, and there was no *post-partum* haemorrhage.

It is rather interesting to consider what would be the proper procedure in such circumstances. Obviously a living child could not be delivered as a vertex presentation. I should think to introduce the hand right into the uterus might make the diagnosis clear and decide whether version would give sufficient length of cord. This would have to be long enough to reach from the placenta to the vulva or thereabouts in a breech. In the case I have described I do not think version would have given sufficient length of cord. Brickner, who has carefully studied the subject, states that delivery cannot occur in such circumstances unless one of the following accidents occurs: separation of the placenta, inversion of the uterus, umbilical hernia of the foetus, or rupture of the cord—the last two being of infrequent occurrence. I should think it might be possible to free one of the loops with the hand in the uterus, or Caesarean section would give the greatest certainty of a living child if one were sure of the condition.

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Reviews.

THE SURGICAL DYSPEPSIAS.

OF the making of books on abdominal surgery there appears to be no end. A short while ago Mr. Sherren published his lectures to students at the London Hospital on the surgery of the stomach and duodenum, and a very excellent little book it was. Now Mr. WALTON, from the same hospital, has brought out a large book on the *Surgical Dyspepsias*.[1] And this, too, is a good book, and well planned. Included in it are not only diseases of the stomach and the duodenum, but also those of the biliary passages, liver, and pancreas, with an account of visceroptosis to round it all off. The title is a challenging one, challenging criticism as well as interest. For not all of these conditions are truly or essentially dyspepsias, nor are they all essentially surgical. But the title has one thing in its favour: it suggests that the author has considered the clinical side of his subject, and has written something more than a book on operative surgery. As a fact, Mr. Walton has been at very great pains to furnish as clear a picture as he can of the various affections of the upper abdomen as met with in practice. And he has skilfully used histories of actual cases to show, as it were, what these conditions look like in their natural state.

Mr. Walton has his own views as to the meanings of symptoms. He emphasizes the importance of the clinical history and the relative lack of importance of the physical examination in the diagnosis of ulcers of the stomach and duodenum. This is an important point, though not, of course, an original observation. It is the most probable explanation of the omissions in diagnosis made by the so-called (and often actually) busy practitioner, who has no time to listen to his patients' often meandering account of their ailments. There is no doubt whatever that in order to be a good and trustworthy diagnostician of abdominal diseases, the practitioner must be a patient listener, ready to seize on important facts which are usually not realized as important by the patient and as frequently clouded over with unimportant detail. The days of the old aphorism, "Eyes first and much, hands next and little, tongue not at all," are as dead as Queen Anne. Major surgery to-day deals less with lumps and tumours obvious to the eye than ever. Nor, we think, should too much reliance be placed on our new eye, the *x* rays. The corroborative value of the opaque meal is great, but it is a gross error to base one's diagnosis, positive or negative, preponderatingly upon it.

Mr. Walton describes well the symptomatology of acute and chronic ulceration of the stomach and duodenum. It is interesting to see the author attacking again the question of acute ulcers, which have fallen into surgical disrepute. Indeed, in one sense Mr. Walton drives another nail into their coffin by stating it as his belief that such ulcers rarely perforate, and that the acute perforations are usually of chronic ulcers. He produces some evidence which gives this view a look of truth, but we cannot quite accept it, for the duodenum at least. He states that all except one of his cases of perforated duodenal ulcer gave a history of previous dyspepsia. His experience in this matter must differ from that of other surgeons. He is no believer in Hale-White's gastrostaxis, and many will agree. He is a believer in the frequent derivation of malignant ulcers from chronic. This is still rather a faith than a demonstrable fact; there is much parallel fact and little direct demonstration. W. C. McCarty, who is as it were the high-priest of this creed, is an unsatisfactory preacher. A close study of his writings leaves the reader mystified as to his real conclusions. Mr. Walton describes a symptomatology which to his mind denotes the malignant degeneration of a previously chronic and benign gastric ulcer. This must at present be accepted with reserve.

The operations on the stomach are very well described and illustrated. The sketches of the various manœuvres associated with the great names of gastric surgery are very clear and valuable. The author naturally has a predilection for the operation which he has helped to popularize—wedge-

[1] *A Textbook of Surgical Dyspepsias.* By A. J. Walton, M.S., M.B., B.Sc.Lond., F.R.C.S.Eng. London: Edward Arnold and Co. 1923. (Med. 8vo, pp. 728; 272 figures, 2 coloured plates. 42s. net.)

resection of the ulcer and gastro-enterostomy, as opposed to pylorectomy, which he reserves for special cases. On the whole, we believe he is on solid ground here. The section on the biliary system is good, and includes an account of his own ingenious and very successful operation for repair of the common bile duct.

One of the most valuable sections of the book is that on visceroptosis. It is becoming increasingly but very gradually clear that visceroptosis is not an affection remediable by surgical means. Many devices have been sought to combat it—divisions of bands and dissections of membranes on the one hand, fixations on the other, colectomies and short circuits. All are destined to one inevitable end. There is the first deceptive improvement, eagerly looked upon by both surgeon and by patient as a cure, and then the customary relapse. This is not to say that these patients should not be explored. Medicine is not a finite subject, so that one may know always and without exception that a patient has or has not a definite disease. And once the abdomen is opened the desire to do something for one's patient leads the surgeon on to perform someone's operation or devise a new one of his own. But it is well that the temporary value of such things should be known.

Mr. Walton has covered a wide field, and that with credit to himself and to British surgery. His views are essentially sound views, and he is not led by false enthusiasms. The book, we think, might have been shorter, and perhaps in future editions Mr. Walton may ruthlessly cut it down. But to the author who is proud and jealous of his work curtailment is the hardest task of all. Medicine, too, is at a disadvantage over the arts in that a certain amount of repetition is essential. The post-graduate is a "dipper"; he does not read a book from cover to cover save rarely. And the unfortunate author has to guard himself against the attacks of his readers. There is an excellent bibliography.

VENEREAL DISEASE IN THE AMERICAN EXPEDITIONARY FORCES.

IN this book, *Venereal Disease in the American Expeditionary Forces*,[2] Dr. GEORGE WALKER, late Colonel Medical Corps, U.S.A., gives a graphic and extremely illuminating account of the various measures taken by the Urological Department of the American Armies to prevent venereal disease among the troops and to treat it when it occurred. Great reliance was placed on what the author describes as "Prophylaxis." Disinfection at a "Prophylactic" station of the individual after exposure, and self-disinfection by the man himself by means of an outfit previously supplied, are both described in this work as "Prophylaxis." Interesting statistics are furnished as to the number of times such treatments were given, and of the number of infections afterwards noted. He comes practically to the same conclusions with regard to the value of "disinfection" of both kinds as the Committee which lately sat in this country under the chairmanship of Lord Trevethin—namely, that "skilled disinfection" at a station is by far the most effectual, but that "self-disinfection" properly and promptly carried out by a well instructed and sober individual gives also a certain measure of protection. The problem which faced the Medical Department of the American forces was indeed a vast and grave one. After the first troops landed at St. Nazaire the infection rate was 240 per thousand per year among the white and 625 per thousand per year among the coloured forces. Very stringent measures were enforced. Brothels were put out of bounds, and prophylaxis (skilled disinfection) insisted on; in the case of the negroes every man on his return to camp was disinfected, whether he had been exposed to infection or not. The result was that the number of cases of disease soon diminished. At many other stations and ports the infection rate, though not as high as that just given, was high enough to cause grave anxiety. In addition to "prophylaxis," other salutary and energetic measures were taken, First, extensive and intensive education. Secondly, places which served as rendezvous were put out of bounds. Thirdly, sources of infection were traced and removed. Fourthly, recreation and amusement for the soldiers were provided. Fifthly, means were taken to lessen the opportunities for the association of the Americans with the French population; and, sixthly, the use of alcohol was restricted. All of these measures were carried into effect as far as possible, and the final result, at the end of the war, was that though it was computed that 71 per cent. of the forces exposed themselves to the risk of infection, the case rate of venereal disease was only 35 per 1,000 per year. Many difficulties were encountered in carrying out this campaign, and also obstruction on the part of some French authorities and some American officers, but the success which rewarded the efforts made is an ample justification of the judgement of the American Urological Department. The horrible conditions obtaining in the "tolerated" houses and among the registered prostitutes are mentioned, and the periodical so-called examinations of the unfortunate women is stated to be quite useless. These examinations, as at that time conducted, were considered to be infinitely more likely to spread disease than diminish it. The chapters on treatment are full and interesting. The statistical tables throughout the book are very complete. The author also discusses the question of venereal disease in the other allied armies and the civilian population, and all he has to say on these subjects is well worth reading. It is evident that much can be done both in the way of prevention and cure when men are under discipline and the medical officers capable and energetic.

ASTHMA.

MR. FRANK COKE'S recent book on *Asthma*[3] shows the change that has taken place in the etiological conception of this condition—namely, that it is the outcome of hypersensitiveness to a foreign protein—and how its modern treatment has altered in accordance with this interpretation. The therapeutic methods are indeed more novel than the etiological views, and Mr. Coke rightly quotes from Hyde Salter's remarkable book published in 1868 to show that the latest work on sensitization to animal hairs and the dermal reaction were anticipated by him. The development of the rational treatment of the affections, aptly termed the toxic idiopathies by Dr. John Freeman, has been a growth of quite recent years, and owes much to him and to I. C. Walker of Boston, Mass. Mr. Coke gives an account of the results obtained in 350 cases of asthma examined and treated on these lines, and recalls the papers by him published in our columns (1921, i, 372) and elsewhere. Although he defends his definition of asthma as "a form of dyspnœa in which the obstruction to respiration lies in and about the bronchi and bronchioles" from the objection that it is too broad, Dr. A. F. Hurst's definition, which is not quoted, as "the reaction of an over-excitable bronchial centre to blood-borne irritants and to peripheral and psychical stimuli" would appear to meet the case better. With apologies for its hybrid character, Mr. Coke suggests the new word "adzyme" to describe "some factor in the blood or tissues responsible for the process whereby an animal becomes sensitive to a foreign protein"; he thinks that it may be convenient until more definite knowledge of the whole syndrome of sensitization and anaphylaxis makes it possible to construct a better one. He imagines that when only small quantities of protein enter the body neutral adzymes deal with them, but that when larger quantities gain an entrance specific adzymes are evolved with the power of acting on or simply uniting with the protein to form a poisonous combination (anaphylatoxin) which causes anaphylaxis; it is suggested that "its method of action is rather by a colloidal change of adsorption than by a proteolytic change in the foreign protein such as can be measured against tryptic and antitryptic valencies." Anaphylaxis and asthma are compared, but the gener-

[2] *Venereal Disease in the American Expeditionary Forces.* By George Walker, M.D., late Colonel Medical Corps, U.S.A. Baltimore, Md.: Medical Standard Book Co. 1923. (Demy 8vo, pp. xxiii+237; 7 charts.)

[3] *Asthma.* By Frank Coke, F.R.C.S. Bristol: John Wright and Sons, Ltd. London: Simpkin, Marshall, Hamilton, Kent and Co., Ltd. 1923. (Demy 8vo, pp. viii + 259. 15s. net.)

practitioner, for whom the book is admittedly intended, will probably get more assistance from its more practical chapters.

The skin tests employed are described and illustrated, and it is stated that a routine of dermal reactions is essential before rational treatment can be carried out. The statistical data of his 350 cases show that 52 per cent. yielded positive reactions; in rather more than half of these there was a family history of asthma, which was found in 42 per cent. of all the cases, and appears to be commoner in females. Fourteen clinical types of asthma are described, including the "thin," the "week-end," the "day or night," and the "colloidoclasic"; several cases of acquired sensitiveness to aspirin are mentioned, and the resulting asthma is explained by some interaction between the drug and the body proteins, probably of an adsorptive nature, leading to a combination providing the specific adzyme that leads to these disastrous consequences when the patient has thus become sensitive to the drug." In the description of the treatment of the acute paroxysm the opinion is expressed that where relief is obtained from aspirin, as sometimes happens, the case is of microbic origin. As to the way in which adrenaline acts, it is pointed out that in asthmatic patients sudden shocks and emotions may lead to disappearance of the spasm as quickly as will a hypodermic injection of adrenaline. Treatment between the attacks and the cure of the affection are considered in detail, and illustrative cases are given under various heads, such as avoidance of the protein to which the patient is sensitive, specific protein therapy, specific vaccine therapy, non-specific vaccine therapy, Danysz's method, and non-specific protein therapy. Specific vaccine treatment is spoken of with some reserve, for although most successful in a small percentage of cases, it is in a large number not only useless but harmful. Under non-specific protein therapy the protein shock treatment is discussed. Consideration of the nasal factor in asthma leads to the conclusion that nasal symptoms are more likely to be part of the complaint than its cause. This work is brightly written and shows evidence of much practical experience and a knowledge of the literature.

A TEXTBOOK OF LARYNGOLOGY.

DR. COAKLEY'S *Manual of Diseases of the Nose and Throat*[4] is a standard work, and as a manual of convenient size for the senior student or practitioner it appears to fulfil every requirement. The essentials of the subject, especially as regards physical examination and diagnosis, are presented clearly and wisely; there is no tendency to exploit any fancies of the author nor to lay stress on methods which have not stood the test of time and experience. The harshest criticism that could be passed would be that in places the additions and alterations required in bringing the new edition up to date have to some extent upset the balance of the original work. There is, however, no topic which is not adequately treated. Possibly the sections on malignant disease might have been enlarged, considering the ever-increasing importance of the subject, particularly from the point of view of early diagnosis. The detailed consideration of the treatment of malignant disease does not fall within the scope of a book of this character.

The chapter on the methods of examining the nose, nasopharynx, pharynx, and larynx is excellent; numerous details are described, attention to which is of the greatest importance both to the comfort of the patient and the success of the examination. The section on diseases of the accessory sinuses, perhaps, shows the author at his best, for it comprises a group of diseases most rebellious to treatment and consequently most provocative of different opinions. Here the views of the author and his advice, especially in regard to treatment, are moderate and wise, and it is interesting to note that he finds that the Caldwell-Luc operation for suppuration in the antrum is rarely required.

The methods of removing tonsils are numerous, and the author practically confines himself to describing that which he himself prefers. The methods, however, really fall into two groups, those in which a guillotine is used and those in which the tonsil is dissected out, and the indications for employing one or other of these methods are tolerably clear. To ignore one or the other seems to deprive the operator of a valuable method suitable to certain cases. A method of securing bleeding vessels is described, which may prove helpful to those who find it difficult to tie ligatures in the depths of the pharynx.

The illustrations are adequate, but the utility and appearance of the book might be improved in this respect. In every other way the book is excellent, and should be useful as a class book for post-graduates or for occasional reference by the practitioner. For some reason not altogether obvious it begins at page 17, but even this has the merit of giving the reader the impression that he may have escaped some dull introductory remarks and has plunged at once deeply into the subject.

[4] *A Manual of Diseases of the Nose and Throat.* By Cornelius G. Coakley, A.M., M.D., F.A.C.S. Sixth edition, revised and enlarged. London: J. and A. Churchill. 1923. (Demy 8vo, pp. vi + 664; 144 figures, 7 plates. 18s. net.)

RADICAL CURE OF HERNIA.

THE aim with which Mr. J. HUTCHINSON has written *Hernia and its Radical Cure*[5] has been, in his own words, "to provide a practical account of the various forms of hernia with special reference to the best methods of obtaining its radical cure." This aim has undoubtedly been attained. The author writes clearly and his opinions rest on mature experience. Subjects such as ventral hernia, and the contents of hernial sacs, commonly very briefly dismissed in the surgical textbooks, are here discussed fully; the non-operative treatment of hernia, anatomical details, and differential diagnosis are omitted. Statistics are quoted to drive home important points, but are not allowed to overburden the text. It is true, as the author points out, that the frequency with which the operation is performed nowadays has led to its difficulties being underestimated, and that the success of the final result depends on careful selection of method and attention to details. In evidence of this he quotes the speedy recurrences which followed operation during the war. In discussing the disputed question of the origin of hernia, he expresses the opinion first that not all indirect hernias are of congenital origin, and, secondly, that all direct, practically all umbilical, and almost all forms of femoral, are acquired. For anaesthesia Mr. Hutchinson prefers the open method, preceded by nitrous oxide and oxygen induction, to the more elaborate forms of local and spinal anaesthesia. For buried sutures he recommends kangaroo tendon. The advantages claimed are that it is strong, durable, and non-irritating, and ultimately becomes normal fibrous tissue, and so part of the living structure; its use renders resort to filigrees and other foreign material for the repair of large hernias unnecessary. The various methods for radical cure are described, and preference is shown for that in which the inguinal canal is closed by drawing down the conjoined tendon to Poupart's ligament in front of the cord.

For repairing the parietes in umbilical hernia the "reinforced mattress-suture method" is recommended. The elliptical transverse wound is made linear by introducing hooked retractors at each end, and then a series of mattress sutures of kangaroo tendon are inserted, traversing peritoneum, fascia, and aponeurosis. The everted edges are caught up by another interrupted series of the same material, which tend to relieve the tension of the previous group. In discussing resection for strangulated hernia, the method of transferring the gangrenous bowel through a separate laparotomy incision, and performing an end-to-end anastomosis in comparative comfort rather than the confined hernial area, is strongly recommended.

The chapter on hernia of special organs is interesting; illustrative cases are quoted describing pitfalls and mentioning the surprises which may be concealed in hernial sacs. The success of early operative treatment, and its great importance to the community, have not been fully realized by the general public.

[5] *Hernia and its Radical Cure.* By J. Hutchinson, F.R.C.S.Eng. Oxford Medical Publications. London: H. Frowde, and Hodder and Stoughton. 1923. (Demy 8vo, pp. xiii+264; 52 figures, 2 plates. 12s. 6d. net.)

NOTES ON BOOKS.

DR. BERNHARD-SMITH, in his book *Poisonous Plants of all Countries*,[6] gives short descriptions, accompanied by small line drawings, of the chief poisonous plants of the world. About a dozen lines are devoted to each plant and the botanical names, the common names, and the chief botanical characteristics are mentioned. We are not sure for what class of reader the book is intended; it is too small to be of much use for general reference, and the line drawings are not sufficiently detailed to be of much use for identification. The plants are classified according to their pharmacological actions under the headings of poisons acting on the brain, on the spinal cord, on the heart, irritants, and specific irritants. This classification results in hemlock, Calabar bean, jaborandi, and ipecacuanha being grouped together as cardiac depressants, while aconite, laurel, and digitalis are grouped as asthenics. We suggest that an alphabetical or botanical classification would be simpler and would produce fewer surprises. Short poetical quotations under each plant are an interesting feature of the book, but unfortunately the application of many of these is rather forced, and in some instances they are perverted from their original meaning. For instance, a quotation from Swinburne's *Garden of Proserpine*, which commences

> "But blooming buds of poppies,
> Green grapes of Proserpine,"

is made to serve for black bryony by the deletion of the first line.

Dr. WILHELM STEKEL'S book on fetishism, for medical practitioners and criminologists,[7] forms the seventh instalment of an immensely long work on disturbances of the impulses and emotions, of which mention was made in the JOURNAL of April 15th, 1922 (p. 607.) The characteristic traits of fetishism are said to be the suppression of active sexuality in both sexes, psycho-sexual infantilism, and in most cases a disposition to accumulate large numbers of his fetish (articles of clothing, hair, flowers, etc.). A tendency to experience again certain infantile pleasures leads to fugues, kleptomania, and exhibitionism. Fetishism is regarded as a compulsion neurosis, which also gratifies the subject's ascetic tendencies. The impulsive actions are carried out in a sort of twilight state, and the fetishist is a day dreamer who fails to realize the differences between reality and dreams. In all cases there is a criminal element (sadism). After all this and much more, it is not surprising to be told that the symbolism of fetishism can only be explained by psycho-analysis. The book contains lengthy descriptions of cases from the practice of the writer and others, some of whom seem to be called sexuologists. How many persons will set out to read this work and how many who make the attempt will thereby be benefited are matters on which we will not speculate.

Since Jules Verne novelists have rather eschewed scientific sensations, but so much has been published in the daily papers about the prodigious store of energy that would be set free by the disruption of the atom that the shrewd reader will make a guess that it provides the plot of a novel entitled *Atoms*,[8] by T. C. WIGNALL and G. D. KNOX. The idea is worked out ingeniously and the possible consequences described in sufficiently lurid colours to satisfy the most insatiate lover of sensation; if the authors have to indulge in some didactic conversations they contrive a thrill in every chapter, and each thrill is skilfully made to arise out of the astonishing speculations and calculations of modern physicists. It is a good book for an idle afternoon, and the reader will be relieved that the worst did not happen.

[6] *Poisonous Plants of all Countries.* By A. Bernhard-Smith. Second edition. London: Baillière, Tindall, and Cox. 1923. (Cr. 8vo, pp. xii + 112; 125 figures. 6s. net.)
[7] *Der Fetischismus. Dargestellt für Aerzte und Kriminalogen.* By Dr. Wilhelm Stekel. Berlin and Vienna: Urban and Schwarzenberg. 1923. (Sup. roy. 8vo, pp. viii + 601; 54 figures.)
[8] London: Mills and Boon. 1923. (Cr. 8vo, pp. 283. Price 7s. 6d.)

BEIT MEMORIAL FELLOWSHIPS.

THE following have been elected to Beit Memorial Fellowships:

Senior Fellowship, value £600 per annum: Dr. David Keilin, fourth year Fellow working under Professor G. H. Nuttall, F.R.S., at the Molteno Institute for Research in Parasitology, University of Cambridge, on the life-history of parasitic protista and on the physiology of parasitic metazoa.

Fourth Year Fellowship, value £400 per annum: Miss Katherine Hope Coward, D.Sc., now working at the Biochemical Laboratory, Institute of Physiology, University College, University of London, on an investigation into the process of metabolism, nutrition and growth of young animals, particularly with reference to so-called deficiency diseases, such as rickets.

In view of the high attainments of the candidates for junior fellowships the trustees decided to award ten fellowships instead of six, and the following were the successful candidates:

John Maurice Hardman Campbell, Senior Demonstrator of Physiology at Guy's Hospital.

Charles George Lambie, Lecturer in Clinical Medicine, Edinburgh University, and Assistant Physician to the Royal Infirmary, Edinburgh.

William Kershaw Slater, who is in receipt of a grant from the Medical Research Council for research work on the heat of combustion of glycogen.

Dorothy Stuart Russell, Pathological Assistant, London Hospital.

Corbet Page Stewart, University Assistant in Medical Chemistry, Edinburgh University.

Harold John Channon, engaged on the study of certain fundamental dietary factors in the nutrition of living organisms.

William Smith, Junior Demonstrator in Biochemistry Classes, Cambridge University.

Lewis Bland Winter, Junior Demonstrator in Biochemistry Classes, Cambridge University.

Dorothy Beatty Steabben, Demonstrator in Physiology and Histology at King's College, London.

Cedric Stanton Hicks, Otago University, New Zealand, Public Analyst for Otago and Southland Provinces, and Chemical Pathologist and Assistant General Pathologist, Otago Medical School.

MEDICAL AND SURGICAL APPLIANCES.

A Resetting Case for Clinical Thermometers.

MESSRS. G. H. ZEAL, LTD., of 77, St. John Street, E.C.1, manufacturers of thermometers, have produced a resetting case for clinical thermometers to which they have given the name Acello. It is an ingenious little instrument, larger than the ordinary thermometer case, but small enough to go into the waistcoat pocket. The case containing the thermometer can be revolved rapidly between a small swivel handle held by the fingers of one hand, and a long handle, working on a screw shaft jointed to the case, held by the fingers of the other hand. The instrument will easily reset the most obstinate thermometer, and is likely to be useful especially to a patient who has to take his own temperature. The price is 2s. 6d.

Urethral Bougies.

MR. BERNARD WARD, F.R.C.S. (Consulting Surgeon, Queen's Hospital, Birmingham), writes: For several years past I have used with advantage urethral bougies considerably shorter in the beak than those usually employed, and Messrs. Arnold and Sons, of 50-52, Wigmore Street, W.1, have recently made some for me. They have a short beak; are graduated from the point to the convexity

of the curve in English, and in the corresponding Charriere scale. The advantage of these bougies is that in the ordinary treatment of a stricture I find they are more easily passed than the usual type. It is rarely necessary to pass them so far that the tip of the bougie goes beyond the membranous urethra; the advantage of this will be at once obvious. The same firm have also made for me a set of bougies with a Benique curve, which are also much shorter in the beak than the usual pattern. In use I find them extremely satisfactory.

An Aid to Ophthalmoscopy.

DR. D. N. HARDCASTLE (Bushey) writes: Last year, after having used an ordinary electric ophthalmoscope for some time, I found that if the light was sufficiently powerful to see the disc in an ordinary room, there was a haze round the slot in the mirror and also from the transverse beam. I tried various forms of mirrors—glass, steel, and silver—but could not obviate this haze and back light from the slot. I then tried building a small hood round the slot, but found this interfered somewhat with the vision. As a last resort I decided to try a glass prism slotted. Messrs. George Spiller, Ltd., have produced a small silvered prism with a slot for vision, and with this have made an ophthalmoscope from which there is no back light or haze, so that the light can now be much stronger and a good view of the disc obtained in full daylight.

A Two-Loop Button Suture.

DR. J. B. PIKE (Loughborough) writes: In the JOURNAL of June 9th, p. 969, I saw a description of a button suture to include two layers of tissue. In June, 1906, I described and illustrated in the *Lancet* a double-loop suture with a similar object, and I think somewhat simpler. It was stated at the time that the method had been used in Australia and by Professor Senn of Chicago. The only English surgeon who has mentioned the use of this suture is Mr. Sampson Handley. Personally I have often found it useful.

THE SUN CURE FOR SURGICAL TUBERCULOSIS.

SIR CLIFFORD ALLBUTT AT ALTON.

BY invitation of Sir William Treloar and his co-trustees, a visit of inspection to the Cripples' Hospital and College at Alton, Hants, was recently paid by the vice-presidents, companions, and local honorary secretaries of the Queen Alexandra League, which was founded to collect money for this institution. The visitors assembled first in the recreation room, where Sir WILLIAM TRELOAR prefaced his speech of welcome by reading a telegram of sympathy and encouragement from Queen Alexandra. He explained that the League now represents 103 local associations, which between them raised more than £9,000 last year for the hospital at Alton. He then asked the Right Hon. Sir Clifford Allbutt, K.C.B., M.D., Regius Professor of Physic in the University of Cambridge, to address the meeting.

"*Surgery Without Surgery.*"

Having indicated his pleasure at being able at length to see the work carried out at Alton, Sir CLIFFORD ALLBUTT said that at first sight it seemed almost a misplaced honour to invite one who was not a surgeon to speak of the achievements of Alton; but Sir Anthony Bowlby, to whom he mentioned this objection, answered: "No! you are right to go because the glory of Alton is that it has abated surgery; it does surgery without surgery." In making this home for crippled children (the speaker continued) Sir William Treloar had had his reward in compassing a relief for them far greater and more complete than he could have dreamed of, bringing them not peace and consolation only, but bodily repair also, and in most cases restoration to health. Calling science to his aid, he associated with himself Sir Henry Gauvain, who thereupon achieved success, not merely by his dexterity and resource as a surgeon, but by pressing into his service other new and beneficent agencies, such as climate, sunlight, and artificial radiations. A striking example of the accurate adaptation of means was seen in the operation of sunlight as a powerful remedy, administered at Alton and Hayling by precise dose and distribution.

Sir Clifford Allbutt then very briefly sketched the history of tuberculosis from the time of Hippocrates, who well described the pulmonary form. It was not until Koch's discovery of the bacillus in 1882 that medicine held the clue—the Ariadne thread—by which to trace and identify the pest in all its insidious penetrations in the bodies of man and many domestic animals.

"Alton is of course a cripples' home, so here the modes of tuberculous destruction are chiefly of the bones, joints and superficial glands. The rapid advances of surgery had for a while tempted us to excise the evil, to make a short cut to cure. But this method belongs to a narrower view of the matter; the disease is perhaps always more or less a general one; and, so far as this is the case, by local excisions our larger ends are not attained. Even if the case be one of an early lesion hardly yet affecting the general system, or affecting it only so much as Nature's own powers might well repair, yet, in the joints especially, a deformity may be perpetuated only a little less than that of the active disease. Furthermore, some affected parts, such as the vertebrae for instance, are out of the reach of the knife; so that, if these parts are not to be given up as beyond hope of treatment, a system must be devised which shall deal alike with the accessible and the inaccessible. And here Sir Henry Gauvain has proclaimed 'Back to Hippocrates! back to the *vis medicatrix Naturae*.' What then is this healing power of Nature? Why, it is but a special instance of the universal law of reciprocal action—that there is no action without reaction. Every impact upon the body is met with a reaction more or less immediately equivalent. Nature always hits back, if often too feebly. Happily, as regards tuberculosis, in the large majority of us the reciprocation is equivalent; the tubercle bacillus is flitting about us all, and doubtless making many an entrance, but in most persons meets with opposition enough to neutralize it. . . . It is in the comparatively few and the comparatively young that it gains a footing."

The old conception of disease (Sir Clifford continued) as a thing to be cast out, had given place to phases of reaction. The morbid process and its cure were intrinsic natural reactions which fortunately could be governed with some considerable success; the physician could give scope to the healing power of Nature and even instruct it. Therein lay the modern doctrines of immunity and antidotal serums and vaccines. But for tuberculosis serology had been so far ineffectual and tuberculin disappointing. Whether Professor Dreyer's new preparation would prove more efficacious time would show. Meanwhile, Sir Henry Gauvain had achieved no little success by putting the diseased parts in the best position to resist. A *modus vivendi* had to be found between effective immobility of a part of the body and the health needs of the whole. The disposition of the organism to recover equilibrium was such that even a severe local damage might ultimately be compensated by some natural re-adaptation; happily every organ had large stores of reserved energy. But in disease the body became less and less able to adapt itself to average circumstances; to the infirm the winds must be tempered and the interplay with the outward stream of things limited. The hospital at Alton was tuned to such a tempering. It became so in part by removal or alleviation of the common stresses of mankind, both mental and bodily; in part by new combinations of influences brought artificially to bear—such as climate, foods, mechanical appliances, and so on; partly again by certain psychical influences of little less importance.

The Healing Power of Light.

Speaking of the remedial influence of light, Sir Clifford Allbutt said:

"In the study of tuberculosis, of rickets, and certain other maladies, and again of radiographic phenomena, attention has been drawn with a new interest to the physiological values of light. Light for the physician is no longer merely a cheerful and refreshing companion of our days, no longer merely the medium of ordinary sight, but a much farther reaching energy. We are realizing that in ordinary vision we have been, and are, using but a very short range of the gamut of light waves, waves which stretch far away both below and above the uses of our vision. Now these farther ranges, both above and below, are coming more and more within the command of the physician, and prove to have powerful physiological properties, powerful both for harm and good; so much so that their use must be guided by a cautious calculation; on the other hand, if so guided they are fraught with marvellous virtues. When in the early seventies of the last century I passed from the coddling of the consumptive in England to him on the uplands of Davos, after dinner at my hotel I asked Dr. Unger where were the patients, and when I was to see them. He laughingly answered, 'Why you have just been dining with them.' 'What,' I said, 'those jolly sunburnt travellers!' 'Yes, just those.' I could hardly believe him; still less did I then discern that the sunburn was far more than a superficial varnish, but signified a profound alteration within. Besides sight and joy, the glorious sun of Switzerland was pouring into these invalids an unseen influence of magical potency. To this occult influence gradually physicians have awakened, and are by direct investigation making themselves masters of it, not only as from the sun itself, but alternatively from the sphere of those artificial rays which belong to the family of *X*. In radiology we have not only a direct and effectual means of cure, but also most wholesome control records of the course of treatment by many kinds of local lesion. In England, at any rate, as we in this summer know too well, we have not sunlight at our command, but in such alternatives as the mercury vapour lamp science has given us some substitute. Among many workers we owe most in this method to Dr. Rollier of Leysin, who has worked out the problems of heliotherapy in large practice; and, if at Alton we have entered into his labours, it has been on terms of repaying the debt with usury. Especially by the invaluable development of a pavilion of 50 beds at Hayling the conditions of application of light, its direction, limitation, dosage and so forth, have been and are being determined. I have spoken of the potency of these invisible rays; fortunately we have found a means of measuring the effects of the treatment, in great part by the degrees of browning of the skin of the exposed limb or body; if the skin tans normally the exposure is effectual and wholesome; if not, the patient is not amenable to the method. There may be some racial difference between the tolerants and the intolerants of the rays; anyway, these differences are thus made plain and must be obeyed. From the sea it seems that the medicinal rays are reflected with high efficiency, so that at Hayling the patients fit for the particular exposures are deriving an enhanced advantage."

Education and After-Care.

Passing next to the therapeutic aspect of the educational methods employed at Alton, Sir Clifford said:

"At Alton education means a drawing out of all the latent faculties of the patient, an experience that in itself, apart from the manner of doing it, is life and joy; a reanimation of body as well as of mind. As somebody said, 'What is the good of an airy house if you have a stuffy mind!' Now we are all materialists enough to admit that mind and body cannot be separated; that one cannot exist without the other; a pianist without a piano is a pianist no more. By mental activity the body also is aroused; higher spirits begin to course along the veins; affections are warmed; hope returns, and the little sufferer begins to feel that at last he too is somebody. Great is the medicine of happiness. It seems probable that not only is the nervous system thus aroused, but also that our wireless endocrine system submits to influences which in the organic life are no less powerful.

"In two ways the work at Alton may be aided: first, by sending early cases, and second, by following up patients after discharge, that the permanence of the cure may be attested and any tendency to relapse checked in time. There are good grounds for hoping that the cures may number 95 per cent. And I would add—let us see that the return home may not be to bad conditions of life, such as probably ministered to the disease; to insufficient food, insanitary houses, low habits of life, and so forth. Greatly to amend these conditions is beyond our individual efforts; but we may do, each one of us, a little by incessantly pressing these needs upon the minds of the leaders of the nation. Indeed, we need not be despondent; much has been done already, although much more lies on the public conscience for future harvesting. . . . And in speaking especially of Alton, may I play on an old string of mine, nay on two: First, may I rejoice in the remarriage of surgery and internal medicine, the divorce of which has been one of the chief banes of Medicine during long periods of its history; and secondly, on the establishment at last in my own university of an Institute for Comparative Medicine in which the study of the diseases of many kinds of animals will throw mutual lights upon those of each; as you know tuberculosis is a disease common to man and many animals."

THE CLIMATE AND REST METHOD.

A warm vote of thanks was accorded to Sir Clifford Allbutt, on the motion of the Medical Superintendent, Sir HENRY GAUVAIN, and the visitors then went on a tour of inspection of the wards and other departments of the hospital. The afternoon was fine, and a very large proportion of the children were receiving the open-air and sun treatment on the balconies which communicate with the wards. Care is taken by the use of movable screens, and in other ways, to avoid blistering; and, by means of such occupations as basket-making, the children's minds are diverted from the fact that they are undergoing a course of treatment. Constant attention to detail is needed in carrying out this form of conservative therapy, both general and local, which may be described in brief as the "climate and rest method." Besides the treatment and education of its child patients, the institution gives technical training in workshops to crippled lads between the ages of 14 and 18 for whom nothing further can be done medically. The majority of the children under treatment are cases of tuberculous hip disease; those with active spinal caries are nursed on special stands designed and made on the premises. An interesting part of the hospital is the plaster room and splint department; nearly 1,000 non-inflammable celluloid splints are put up in the course of each year. One ward in each of the two fan-shaped medical blocks is set apart as an observation ward, where every new patient on admission is kept in quarantine in a separate cubicle for at least a fortnight. During this period the patient is fully investigated, medically and from the educational aspect, and splints are prepared.

The bright eyes, bronzed skin, and firm flesh of these children speak eloquently in favour of the sun cure when judiciously applied in appropriate cases. Every kind and degree of pigmentation can be observed on their bodies as they lie out in the sunshine, naked but for a sun-hat, a loin-cloth, and (in most cases) a splint.

Members of the British Medical Association attending the Annual Meeting next week at Portsmouth will have opportunities of visiting both the Cripples' Home at Alton and the associated Hayling Island Sanatorium.

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.

CONFERENCE IN BIRMINGHAM.

THE opening session of the Ninth Annual Conference of the National Association for the Prevention of Tuberculosis was held in the University of Birmingham on July 12th, and in spite of the torrid atmosphere there was a crowded and, as events turned out, an enthusiastic meeting. The delegates were welcomed by the LORD MAYOR OF BIRMINGHAM (Sir David Davis), who referred with justifiable pride to the part played by the city he represented in the campaign against tuberculosis. The Hon. Sir ARTHUR STANLEY, who presided, thanked the Lord Mayor on behalf of the association and commented in a few happily chosen sentences on the high civic spirit of Birmingham.

Care of Advanced Cases.

The subject down for discussion was the care of advanced cases of tuberculosis, especially with regard to the prevention of infection. In the absence of Dr. William Robertson, M.O.H. for the City of Edinburgh, who was to have initiated the discussion, his contribution was read by Dr. JOHN ROBERTSON, M.O.H. for Birmingham. The author of the paper hazarded the view that the segregation of advanced cases of pulmonary tuberculosis was quite as important in its way as the isolation of a case of small-pox, and in dealing with the problems offered by the incorrigible "in-and-out" tuberculous subject, who, after a short period passed in an institution, insisted on leaving and returning to his home, where he was a grave potential danger to his friends, suggested that the use of more drastic measures for compulsory detention should be exercised by the sanitary authorities. He further emphasized the need for a more thorough system of disinfection of the rooms occupied by such a person. Housing was the *alpha* of the tuberculosis problem, but the disposal of the advanced cases constituted its *omega*.

Dr. F. N. KAY MENZIES (London County Council) questioned whether institutional segregation was the best policy, and further suggested that exaggerated statements had been made as to the infectivity of the disease. He thought that if the impression was given that the responsible authorities considered that the infectivity of tuberculosis was little less than that of small-pox, it might create difficulties in administration, and especially with regard to after-care work. In his view home segregation should be first considered, and, in default of this only, institutional segregation. The main consideration was the avoidance of the infection of children. He regarded food and not housing as the *alpha* of the tuberculosis problem.

Professor S. LYLE CUMMINS, who followed, emphasized the danger of infection. Every case of pulmonary tuberculosis had at one time been infected, although this might have been years before the development of the disease. The chronic fibroid type of advanced case, often only seemingly showing evidence of chronic bronchitis or asthma, was the most dangerous from the point of view of infection. In an inquiry undertaken by the medical staff of the Welsh National Memorial Association recently, 51 per cent. of 354 female cases and 33 per cent. of 268 males had a history of definite contact with such cases in their homes. He did not, however, believe in compulsory segregation. We still know too little about the disease and must endow research more generously than at present.

In the opinion of Dr. DAVISON (Assistant M.O.H. Birmingham) any such preventive measures as had been suggested must first be acceptable to the public. He was in favour of encouraging segregation in the home after a period of educational treatment in a sanatorium, as being the most humane method. There were many young adults in full work quite as dangerous sources of infection as the typical advanced case.

Some characteristic points were made by Dr. MARCUS PATERSON. He referred to the type of tuberculous person who not only made no attempt to follow advice given, but was often in fact wilfully harmful. These cases should be taken before a magistrate and certified as a danger to the community like any ordinary lunatic. There were several

varieties of advanced disease, each of which had to be dealt with in a different fashion. He further advocated hostels for tuberculous single persons in place of common lodging-houses, and in this connexion did not hesitate to recommend the establishment of a civil canteen.

Dr. A. FERGUS HEWAT (Assistant Physician, Royal Infirmary, Edinburgh) and Dr. ERNEST WATT (Medical Officer, Scottish Board of Health) continued the discussion, which was wound up by Dr. JOHN ROBERTSON.

Surgical Tuberculosis from Milk.

The afternoon session had for consideration "The extent and nature of the damage done by tuberculosis derived from infected milk." The discussion was opened by Mr. J. D. WATSON in an interesting paper in which he described his first experimental efforts under the auspices of the Birmingham Drainage Board to obtain a tuberculosis-free dairy herd. The scheme adopted was a modified form of Bang's isolation method. This possessed the merit of simplicity and was capable of being put into operation without elaborate preparations. The two main objects were to rear healthy calves from stock certified to be free from tuberculosis and to segregate the healthy from the unhealthy cows. Experience soon proved that the ideal aimed at could not be attained immediately without pecuniary loss. All the reactors, therefore, were not disposed of at once, the younger cows being kept and bred from, a pedigree bull certified to be tuberculosis-free having been first obtained. Recurring tests appeared to point to the satisfactory conclusion that, by the maintenance of a consistent procedure, it was possible within four years of its initiation, and at small expense, to eliminate tuberculosis from a herd of shorthorn cows, which on the first test showed 60 per cent. to be suffering from the disease.

Sir GILBERT BARLING said he strongly supported the view that tuberculosis was not transmitted by inheritance. A certain delicacy or vulnerability of tissues, however, was transmitted. It appeared to him that within recent years there had been a decided diminution in the number of cases of tuberculosis of the bones and joints. Dealing with the points raised by the last speaker, he did not consider the complete extirpation of tuberculosis from dairy herds a practical proposition at the present time. In these circumstances he was of opinion that a Commission should be set up by the Ministry of Health to settle once and for all, if possible, the value of pasteurized milk. There were still conflicting views on this question. Tubercle-free milk could be got, but he warned the public to see that they got what they paid for in such a case.

Dr. JOHN FRASER (Surgeon to the Royal Hospital for Sick Children, Edinburgh) also contributed a paper to the discussion. He could not agree that the incidence of surgical tuberculosis showed any sign of diminution up to the present, war conditions and more recently the widespread unemployment with its attendant poverty probably being contributory causes. The great majority of cases of tuberculosis were infected during early childhood when resistance to infection is low, and the manifestations of later life were the recrudescence of this early infection. No limit could be set to the period during which the living bacillus might exist in the human body even without any clinical manifestations of tuberculosis. He believed that bovine infection, which was but another name for milk infection, was responsible for the vast majority of cases of surgical tuberculosis. The first essential of pure milk was a herd of tuberculin-tested and preferably home-bred healthy cows. The most rigid attention to hygiene in the necessary handling of the milk should also be enforced.

Sir HENRY GAUVAIN, by the aid of some beautiful lantern slides, brought vividly before the Conference the terrible ravages of surgical tuberculosis in childhood. In his opinion bovine infection conveyed by the milk supply was responsible for this. The bright side of the picture was shown in the wonderful results of treatment of such cases at Alton and Hayling Island. This treatment was costly, however, and many thousands of children had to undergo terrible suffering unnecessarily as the result of a polluted milk supply. The present position cried urgently for redress. There should be more open-air and sun schools to increase the resistance of the juvenile population, and this should apply to children of the pre-tuberculous type as well.

Mr. BRENNAN DE VINE (Chief Veterinary Officer, City of Birmingham) also contributed a paper on the subject and gave some instructive figures with regard to the Birmingham scheme. He pointed out that a cow may yield tuberculous milk even when there were no appreciable signs of disease of the udder. All reacting animals should be immediately isolated. More attention should be paid to the ventilation and cubic space of cowsheds, and calves should be fed only on milk from tubercle-free cows. Dr. HAROLD SCURFIELD (late Medical Officer of Health, City of Sheffield), Mr. BUCKLEY, and Dr. MUNRO also contributed to an interesting discussion, which Dr. JOHN ROBERTSON concluded, recording his belief in the pasteurization and bottling of milk. Tuberculin-testing was carried out free of charge for the farmers round Birmingham.

At the conclusion of the regular session the annual meeting of the association was held, and Dr. F. J. H. COUTTS (of the Ministry of Health) opened a discussion on "The work of Tuberculosis Care Committees." Mr. G. W. ALLEN (Director of the Tuberculosis Ex-Service Men's Society) condemned the "official" training of ex-service tuberculous men as a waste of public funds, and claimed that the small efforts of the society which he represented showed better practical results. Miss MCGAW (member of the council of the association) also contributed to the discussion.

Tuberculosis in Industrial Workers.

The proceedings of the morning session of the second day of the Conference opened with a paper on the "Relative prevalence of tuberculosis among workers in different trades," by Professor EDGAR COLLIS, which was listened to with much appreciation. Industry, he said, had been accused of being the last stronghold of phthisis, and there was a large element of truth in this so far as adult tuberculosis was concerned. Generally speaking, whenever the habits and customs of a community in which tuberculosis was endemic were disturbed the disease had become more prevalent. Associated with this increased prevalence, the age of maximum incidence of the disease moved from later to early adult years. When a community settled down to the new and altered conditions the age of maximum incidence again receded to later life. This must be borne in mind when the specific occupational prevalence of the disease is being investigated. Professor Collis gave figures to show that the incidence of phthisis is higher and at a later period of life in that portion of the community most concerned with industrial occupation. He also gave tables showing the influence of social status and certain occupational groups on the mortality rate of pulmonary tuberculosis. There appeared to be three influences exhibited by these occupational records which conduced to phthisis—(*a*) aggregation of individuals employed at sedentary work; (*b*) the alcoholic habit by lowering the general resistance to disease; (*c*) exposure to certain dusts which contain silica. On the other hand, hard work, mental or physical, outdoor life, or uncrowded indoor life in no way favoured the disease. He regarded industrial prosperity as the most valuable instrument for the reduction of tuberculosis. Workers ought not to sit facing one another on either side of a narrow table, nor elbow to elbow. Economy of space meant economy of health. With regard to exposure to dust, the medical profession had done its part in calling attention to the particularly injurious character of silica dust: the industrial engineer must now do his and remove it.

Dr. G. B. DIXON (Chief Tuberculosis Officer, Birmingham) followed with a paper on the incidence of tuberculosis among brass workers, and gave some interesting details of the brass trade processes. He pointed out that workers in the "dipping" shops were exposed to the inhalation of acid fumes and that they very frequently had to stand on wet floors, and that in the casting shops the men were exposed to extremes of temperature as well as to the inhalation of zinc. An analysis of the occupations and ailments of 3,000 out-patients attending the Birmingham General Hospital showed that the ailments particularly affecting brass workers could be divided into two main groups:

(*a*) those giving rise to anaemia and gastritis; (*b*) those affecting the respiratory tract, of which tuberculosis was the more prevalent. If the injurious effects of this trade were to be reduced to a minimum, adequate methods of ventilation must be utilized and provision made for the rapid removal of dust. Bathing facilities might be made available for the men after leaving work, and it was of some importance that the amount of clothing worn should be increased on coming into a cooler atmosphere. More temperate habits were also desirable among this class of worker.

Mr. G. A. ISAACS, of the National Society of Operative Printers and Assistants, also contributed some valuable information to the discussion from the point of view of the interested layman. He refuted the popular view that compositors were more seriously affected by tuberculosis than any other branch of the printing trade, and quoted the result of an inquiry by the late Professor Benjamin Moore which showed that in the case of printers' assistants nearly one-half of all deaths were due to phthisis even at the present time. He considered that there were more deaths due to tuberculosis than the death certificates would indicate. With regard to the conditions under which machine-room work was carried on, these had considerably improved, but much had still to be done, and better wages had resulted in a great improvement in the physical condition of the workers. He asked for the co-operation of the medical profession in making the printing trade at least as healthy as other trades. Dr. SCURFIELD put in a plea for the breaking up of the tuberculosis death-rate into its component parts in order that the nature and extent of the problem of prevention as affecting various localities might be more clearly recognized.

Dr. J. DOIG MCCRINDLE (Chief Tuberculosis Officer, Northampton) took up the discussion in connexion with the boot industry. He gave an interesting résumé of the processes of bootmaking which threw some light upon the prevalence of tuberculosis among boot and shoe workers. Apart from its sedentary character, there seemed to be nothing intrinsically detrimental to health in this occupation, but the close proximity of the operatives to one another, and the frequently imperfect ventilation and lighting, were no doubt contributory causes in the high incidence of tuberculosis in this industry. The boot worker suffering from tuberculosis should, when the disease had been arrested as the result of treatment at a sanatorium, be given the opportunity of resuming his own work under the graduated labour system.

Notification of Tuberculosis.

The afternoon session, which met under the presidency of Sir ROBERT PHILIP in the unavoidable absence of Sir Arthur Stanley, dealt with the question of the "Notification of Tuberculosis," the discussion being opened by Dr. G. LISSANT COX (Central Tuberculosis Officer, Lancashire County Council). He was of opinion that while the Tuberculosis Regulations were admirably drawn up from an academic point of view and provided for every contingency if properly carried out, in actual practice some of the provisions had given rise to misconception with unfortunate results to the public health. Article V of the Regulations appeared to call for amendment more than any other. The profession should be encouraged to notify every case occurring in practice, even at the expense of duplication of notification. Further, as suggested by Dr. Dudfield, the medical practitioner should repeat his notification if the patient moved into a new district and the same practitioner remained in attendance. A large proportion of notified cases were too frequently in a late stage of the disease when notification was carried out, many of them having had no medical attendance until this stage had been reached. On the other hand, there did not appear to be any large number of cases of unreasonable delay by the doctors in referring cases to the tuberculosis officer. The further education of the public as to the symptoms and dangers of tuberculosis and the need for seeking advice early was urgently called for. The general practitioner should be encouraged to refer all doubtful or early cases to the tuberculosis officer. It was now possible, with the concurrence of the notifying practitioner, to have cancellation of any case wrongly notified as tuberculosis.

Dr. DUDFIELD (Administrative Tuberculosis Officer, Paddington) followed, and said that Dr. Cox had anticipated his remarks for the most part. He said it was a disappointing fact that compulsory notification of tuberculosis had not achieved the success hoped for. Not only was notification incomplete, but too many certificates were received too late. The proportion of deaths from pulmonary tuberculosis representing fatal terminations of cases not known to him before death had occurred had notably increased. There had of late, however, been some improvement in the notification of non-pulmonary tuberculosis. Articles V and VII of the Regulations both needed amendment. The administrative difficulties which often arose when patients left the district in which they had originally been notified and had refrained from seeking advice in their new homes might be overcome by friendly sympathy and tactfulness on the part of tuberculosis visitors or nurses.

In the opinion of Dr. A. S. M. MACGREGOR (Public Health Department, Glasgow) efficient notification depended upon an efficient tuberculosis service, and the provision of proper treatment was dependent upon promptitude of notification. He thought that our diagnostic service was not so efficient as it might be. Diagnosis and the facilities for this should be in the forefront of any tuberculosis scheme. There was a danger that the tuberculosis officer might develop a bias towards the diagnosis of pulmonary tuberculosis when the patient was not really suffering from this but from some other chest affection. The tuberculosis service had not been free from criticism in this respect.

Dr. CECIL WALL (Physician to the London Hospital and to Brompton Hospital) suggested that the ideal to be aimed at should be the notification not only of undoubted cases of tuberculosis but of suspected cases, and that the printed form should be so amended to allow of this being done. Notification should be repeated at intervals of six months if the patient was still under treatment. He further thought that there should be a clearing-house or bureau for the whole country.

The proceedings closed with a hearty vote of thanks to the Lord Mayor of Birmingham, and to Dr. John Robertson for his invaluable assistance, which contributed so much to making the present Conference one of the most successful ever held by the National Association.

As a fitting pendant to the work of the Conference, a public address on "The Actual Position of the Tuberculosis Problem To-day" was delivered by Professor Sir ROBERT PHILIP on the evening of the second day, in the Midland Institute, to a large and appreciative audience.

THE NATIONAL PROVIDENT ASSOCIATION FOR HOSPITAL AND ADDITIONAL MEDICAL SERVICES.

IN the SUPPLEMENT of April 20th, 1921, page 161, was published a scheme for the provision of hospital and other medical services drafted by the Council of the Metropolitan Counties Branch, and based upon what is known as the Sussex scheme. Under the title "The National Provident Association for Hospital and Additional Medical Services" the scheme then outlined took shape in London in November, 1921; and we have now received a report by the executive committee covering the period from November 1st, 1921, to February 28th, 1923. The report is signed by Sir Arthur Stanley, Lord Dawson, Mr. W. McAdam Eccles, Sir Alan Garrett Anderson, and Dr. J. F. Gordon Dill, and is as follows:

The National Provident Association for Hospital and Additional Medical Services, by arrangement with the several interests concerned, was established in London on November 1st, 1921, and £55 was spent in a few newspaper advertisements. When 2,315 members were rapidly enrolled it was decided to treat the first year's working as an experiment, and not seek further members until the Association was incorporated and put on a permanent basis. The amount received in subscriptions was £1,770.

The object of the Association was to induce people while in health to make provision for the time of serious illness and to enable its members to obtain such services other than ordinary

(that is, general practitioner) treatment as they might require in illness without additional charge, and the services provided included *inter alia* (*a*) the ordinary services of a co-operating hospital, (*b*) consultations at home in serious illness, (*c*) the services of visiting nurses, (*d*) treatment at the Radium Institute when required, and (*e*) the use of ambulances.

It was decided:

1. That the scheme should be provident—that is, that the subscriptions should be of such amount as would in the aggregate meet the cost of the services required without encroachment upon charitable funds.
2. That the administration should be in the hands of a neutral body which should impartially guard the interests of all concerned.
3. That the work of the general practitioner should not be interfered with, but that, as far as possible, he should be helped in his work for the benefit of those of his patients who were members of the Association.
4. That all benefits under the scheme should be obtained on the recommendation of the private medical attendant of the member.
5. That there should be no interference with the existing rules or routine and work of the hospitals or of any other bodies concerned.
6. That the income limit prescribed for members should, as nearly as possible, be in accordance with the income limits of those ordinarily admitted to hospital treatment.

Arrangements had also been made for group membership on the same principles at a lower rate of subscription which would cover the hospital services only, but this branch was transferred to the Hospitals Saving Association, who also took over and carried through the incorporation which had been applied for to the Board of Trade.

The income of £1,770 for the period was allocated beforehand as follows, namely:

	£	s.	d.
To Nursing (3/40ths)	132	15	0
„ Ambulances (1/40th)	44	5	0
„ Consultations at home, and Radium (6/40ths)	265	10	0
„ Co-operating Hospitals (26/40ths) ...	1,150	10	0
„ Administrations (3/80ths)	66	7	6
„ Reserve (5/80ths)	110	12	6

Of the 2,315 members, 56, or 2.4 per cent., were in-patients during the year, and their average stay in hospital was 23.8 days; 258, or 11 per cent., were treated as out-patients or received special services, such as *x* ray, massage, electrical treatment, laboratory investigations, etc., the returns showing a total of 1,378 attendances, or an average of 5.4 per patient.

The payments to co-operating hospitals, amounting to £1,150 10s., are equivalent to a payment of £5 7s. 1d. a week for each in-patient and of 10s. for each out-patient, and include any provision which the hospitals may have made for a payment to general medical staff funds. Consultations in the patients' own homes were paid for by a fee of three guineas for each consultation. The payment allocated to nursing has been paid in full, but after paying for all the services rendered during the period, a balance of £406 remains in hand upon the other accounts after all liabilities to members have been finally discharged.

The committee feels that the year's experiment has fully justified its anticipations, and the statistical results encourage it to hope that in a system of provident co-operation lies the solution to the financial problem of the voluntary hospitals.

The executive committee of the Provident Association decided to treat this scheme as an experiment, and took in no new members after February 28th, 1922. The hospitals which had agreed to take part in the scheme were the London, St. Thomas's, and the Royal Free. In ceasing to enrol new members the committee was actuated by a desire to leave full freedom of action to the Hospitals Saving Association in its endeavour to secure a larger measure of co-operation amongst the several hospitals. Now, however, it seems to have been thought advisable to revive the Association, which was incorporated on May 9th last under the title "The British Provident Association for Hospital and Additional Services."

Persons enrolled under the scheme in London were arranged in three groups: (1) those without any dependants, (2) those with one dependant, (3) families. Reduced charges were made to the second and third classes. The whole of the money allocated to the hospital and nursing services was distributed without deduction, but payment for consultations, radium treatment, and ambulances was limited to charges for actual services rendered. Of the £265 10s. allocated to the consultations and radium account only £32 10s. were spent, and ambulances cost only £1 10s. 6d. Fees for consultation were paid to the consultants employed, but the committee has not sought to know whether any proportion of the payments to the hospitals was passed to a medical staff fund. If 25 per cent. of the money allocated to the hospitals were passed to such a fund the actual payment to the hospital for each in-patient would be £4 0s. 3d., and for each out-patient 7s. 6d.—sufficient in the one case in most hospitals to cover the cost of a bed, and in the other considerably exceeding the estimated cost per out-patient.

The success of the scheme in its experimental stage seems to justify the hopes of the executive committee; and we congratulate the members of the committee upon the care they have spent in considering the interests of all concerned, from patient to general practitioner. In the Memorandum and Articles of Association, dated May 4th, 1923, the name of the organization now appears as the British Provident Association for Hospital and Additional Services.

PREVENTION OF VENEREAL DISEASE.

THE fourth annual general meeting of the Society for the Prevention of Venereal Disease was held on July 13th.

Lord WILLOUGHBY DE BROKE, the President, gave an address pointing out that the Trevethin Report amounted to a complete vindication and endorsement of the Society's policy, and proposed the following resolution:

> "That the Society for the Prevention of Venereal Disease accept the Trevethin Report as a document supporting the six essentials of the policy of the Society, namely, that:
>
> 1. A man who after exposure is properly and thoroughly disinfected by disinfectants of appropriate nature and strength, runs little risk of infection.
> 2. An intelligent man if furnished with reasonable instructions can, in favourable conditions, effectively disinfect himself.
> 3. The adoption of skilled disinfection (in disinfecting centres) is not to be recommended as part of any general system, for reasons of time, cost and impracticability.
> 4. The instruction by medical officers of venereal disease clinics of male persons attending such clinics, in the preventive use of disinfectants, offers a useful means of educating the community.
> 5. There is no evidence of facts in support of the view that any system of disinfection would tend to increase the number of exposures and raise the disease rate.
> 6. The law should be altered so as to permit properly qualified chemists to sell *ad hoc* disinfectants provided such disinfectants are sold in a form approved and with instructions for use approved by some competent authority.
>
> And also in view of the unqualified acceptance of the Trevethin Report by the National Council for Combating Venereal Diseases, that the Society for the Prevention of Venereal Disease is prepared to form a Joint Committee with the National Council for Combating Venereal Diseases under the Chairmanship of Lord Dawson of Penn, to watch and further the policy based on the terms of the Trevethin Report."

Dr. J. H. SEQUEIRA, in seconding the resolution, said that as one who had served on the Trevethin Committee he had been struck by the unanimity of the evidence in favour of immediate self-disinfection, which had greatly impressed the Committee as a whole. Lady ASKWITH, chairman of the Women's Committee, in supporting the resolution, said that she looked upon that day as the greatest in the society's existence, and considered that the Trevethin Report offered great hopes that at last something would be done for the protection of the health of women and children. Mr. BASIL PETO, M.P., urged that immediate steps be taken so as to ensure that the necessary bill to amend the Venereal Diseases Act, 1917, should be presented in the autumn session. Mr. FRANK SOUTER said he had just returned from a visit to the Far East, where branches of the society had been established, with the result that venereal disease had been greatly reduced, to the immense benefit of local production and trade.

The resolution was carried unanimously.

The honorary secretary, Mr. H. WANSEY BAYLY, in presenting the annual report, stated that opposition to the society's policy was now based, not on the society's published policy, but on a misunderstanding and consequent misrepresentation of such policy by certain persons, the most prominent being Lord Astor, who was chairman of the Interdepartmental Committee whose unsatisfactory report was the reason of the society's foundation. He considered that as the National Council for Combating Venereal Diseases and the Society for the Prevention of Venereal Disease had both unconditionally accepted the Trevethin Report, the only logical sequel was cordial co-operation between the two societies, to press for the carrying into effect of the recommendations contained in the Trevethin Report.

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ANTLERS AND BONE GROWTH.

IN these days of specialization, when the minds of men are absorbed by the study of sharply defined and particularized problems, it is inspiring to be confronted with one who grapples with things on the grand scale. We live in an age which is shy of generalizations, and truly the comprehensive reasoner often leaves himself open to attack. No one can deny the charm of these wide conceptions, but in order that they may bring us profit they must be propounded by one of great austerity and purity of mind. In his last book the late W. H. Hudson describes how he watched a hind in Richmond Park. The animal lay listening for a long time to sounds issuing apparently from a wood some distance away, sounds which were of the greatest interest to it, yet none of them appreciable to the human ear. The behaviour of the deer furnishes Hudson with material for a leisurely discussion on the nature of hearing in animals, vague and nebulous often, but always delightful in his charming prose.

Sir William Macewen, in his presidential address to the Société Internationale de Chirurgie, also takes the deer as his subject, and uses the growth of the antler to illustrate his views on the formation of bone. Now if we compare these two generalizations, or rather these men who made them, we find Hudson with a great reputation as a naturalist. If his reputation rested on that alone it is unlikely that he would be long remembered, for though he was a keen and accurate observer of birds and animals all his life, his was not a coldly scientific mind. He believed, for instance, in maternal impressions; he believed that the appreciation of smells and scent depended on the solution of the substance in the fluids of the nose. He believed, that is, that the odoriferous substance was a solid, in infinitely fine suspension perhaps, and that this, dissolved in the mucus of the upper olfactory passages, gave the necessary stimulus to the rhinencephalon. To put the matter thus prosaically is the absolute negation of Hudsonism. Hudson would never have dreamed of using such language, and we should have been the poorer had he done so. When we turn from him to Sir William Macewen we realize a different texture of mind altogether—a different standard. Macewen's work bears the stamp of the Royal Society; Hudson's resembles a popular lecture at the Royal Institution. And Macewen's Royal Society is the Royal Society of days when men were concerned with the wide problems of human origin and variation rather than with minute and specialized questions—with broad principles rather than with special corners of the animal kingdom. And if we must date it, it is interesting to know that the acknowledgement of the receipt of Sir William's first communication to the Royal Society on the restoration of the humerus by bone grafting was signed by Huxley.

Like all important discoveries, the study of the antler as the means of disclosing the general principles of the growth of bone is so obviously the simple and right way that one wonders that we had to wait 184 years—from Duhamel to Macewen. The meaning of the antler has always been an interesting problem. Darwin was puzzled to account for it. The rapid growth, the subsequent shedding after so short a period of wearing, the cumbrous nature of the mature structure, all present their problems and discrepancies. As an instrument of offence against any animal save one similarly armed the antler is not well planned. And there is reason to believe that the animal's sharp forefeet are much more deadly weapons. The deer's chief asset is its speed, that it may live to fight another day.

It is good to know that a thing which has troubled so many minds has been so largely the means of solving an important problem. Sir William Macewen's work on the osteoblast as "the one and only begetter" of bone has very largely proved itself. It was in the antler of the deer that he first saw the mature osteoblast conclusively. It has since been found in growing bone generally. He believes that it is a definite cell, recognizable on morphological grounds, and not merely, like a mouse in the wainscot, recognizable by the things it does.

In his present address he shows us how far-reaching in its effects is his conception of the formation of bone, but especially how elusive is the factor behind it all—the something which controls that growth. It is evident that the osteoblasts on the diaphyseal and epiphyseal sides of the cartilaginous plate in growing bone have somewhat different functions to perform, and those in the centre of the shaft something different again. Now what gave these their characters? Are they inherited? Must we, as the anatomists are so fond of saying, go further and further back? And why is the reparative function of the flat bones of the calvarium so limited? Sir William Macewen suggests the reason; but what is the cause? Is reason here synonymous with cause? Sir William Macewen recognizes in the bone cells hereditary specialism to type. He speaks of "the thousand memories of the atoms comprising each osteoblast." The doctrine he inculcates obviously has a very important bearing, not only on surgical pathology, but also on physiology and histological anatomy. Those who are working in the special fields of reparative and (as they hope) constructive surgery stand in need of these gentle reminders. They will show their worth by the manner in which they respond.

"The proper study of mankind is man," said Pope. But we shall do well to continue to take this not too literally. Of the many problems which await solution we shall gain much in knowledge and much more in wisdom by taking the wide view, in comparative physiology and pathology no less than in anatomy.

THE WORK AND FINANCES OF VOLUNTARY HOSPITALS.

THE voluntary hospitals during the last few years have been experiencing some of the vicissitudes which are apt to occur in the careers of institutions, and individuals—such as politicians—dependent on public favour. During the war the British public admired the readiness of the voluntary hospitals to use their resources for the benefit of the wounded soldier, and positively blushed to possess establishments so efficient. In the reaction after the war the discovery that the hospitals were short of money perturbed the mind of the general public, always disposed to judge the impecunious harshly, and greatly pleased the

socialist, who proclaimed one more failure of voluntary effort, one more evidence for the need of State control. Then came a counter-reaction, and people began to inquire personally, locally, and by commission whether things were really so bad as was alleged. It appeared that the position was certainly not hopeless, and that the voluntary system had certain advantages over State administration, as displayed in Germany, which made it worth while to attempt to continue it.

To the development of this opinion the investigations of Sir Napier Burnett and his reports to the Joint Council of the Order of St. John and the British Red Cross Society have largely contributed. His latest report—that for 1922—just issued[1] will encourage the friends of the voluntary system to increase their efforts to perpetuate what is one of the finest examples of the capacity of the British race to organize and administer its own institutions.

Sir Napier Burnett's report is concerned with the voluntary hospitals in Great Britain, but excludes London, because the hospitals in that area are under the supervision of King Edward's Hospital Fund. The hospitals in England and Wales and in Scotland respectively are treated separately, but the results are combined in an interesting introduction. The report is founded on returns from 643 voluntary hospitals (87 per cent. of the whole) containing 40,331 available beds, or 94 per cent. of the total. The number of new patients treated was 2,090,855, at a total cost to the hospitals of £4,946,299. The total number of new in-patients treated at the 643 hospitals was 501,945, and the total number of new out-patients 1,588,910. The number of 643 hospitals is made up of 571 in England and Wales and 72 in Scotland. The total number of new in-patients in England and Wales was 403,036, and in Scotland 98,909. The new out-patients in England and Wales numbered 1,277,338, and in Scotland 311,572. An interesting piece of information is given in a table from which it appears that thirteen teaching hospitals in England and Wales were responsible for 30 per cent. of the total patients treated by the 571 hospitals—approximately one-third of the whole. In Scotland six teaching hospitals were responsible for 51 per cent. of the total patients treated at the 72 hospitals, or more than one-half of the whole.

In a note which Sir Arthur Stanley, chairman of the Joint Council, has prefixed to the report, he calls particular attention to the facts stated by Sir Napier Burnett with regard to cottage hospitals, under which heading are included hospitals with less than thirty beds; in England and Wales there were 314 in 1922—an increase of 13 as compared with 1920—and in Scotland 41, an increase of 2. The total number of beds provided in these hospitals in England and Wales rose from 4,271 in 1920 to 4,572 in 1922; in Scotland the increase was from 552 to 607. The total number of beds in cottage hospitals in Great Britain was 5,179, but of these approximately 2,000 remained idle throughout 1922. Sir Arthur Stanley's comment is that the facts appear to call for better co-ordination of the work, and he commends their careful perusal, "not only to those in charge of cottage hospitals, but also to the governors of hospitals in crowded districts, who are always faced with a long list of patients awaiting admission."

In a section of his introduction dealing with the investigation of the cause and nature of disease, Sir Napier Burnett divides the work done in hospitals into two categories: "defensive," when the patient is admitted to hospital for the repair of damage already done, and "offensive" work, which seeks to ascertain the cause and nature of disease which necessitates admission to the hospital. "It is," he says, "even yet too little recognized by the public that the great and ever-expanding science of preventive medicine owes its existence in large measure to the work carried out in the hospital laboratories." In the case of the larger hospitals he states that laboratory accommodation has been evolved during the past twenty-five years from a single room and one trained worker until there is now a pathological and bacteriological institute attached to many of the hospitals complete in all departments and staffed by highly trained workers, each a specialist in his own particular subject. With regard to smaller hospitals, he says, "the gratifying information is to be found in many annual reports that during the past year steps have been taken to establish some form of laboratory accommodation." "But," he adds, "the establishment of adequate laboratory accommodation and equipment is a matter requiring patient consideration, owing to the cost involved and the question of the supply of the requisite trained personnel." This last is undoubtedly a most important point, and somehow or other means must be found for making hospital laboratory work a career to which a man may devote his life. Such work is on the borderline of research, and with proper encouragement the border may in many cases with great advantage be overstepped.

In discussing the financial situation attention is directed to the fact, not always sufficiently appreciated, that the voluntary hospital system as a whole is to an important extent dependent upon the endowments provided by earlier generations. In the case of 666 hospitals with regard to which particulars have been obtained in this respect, the total amount of invested funds is over seventeen millions sterling, yielding an annual income of nearly £800,000. There was a great improvement in the financial poition of the voluntary hospitals in Great Britain in 1922. In the previous year (1921) their ordinary income failed to meet the ordinary expenditure by £419,138; in 1922 the corresponding figure was £74,978. A remarkable fact brought out by the analysis of the returns is that 378 (57 per cent.) of the 666 hospitals had an excess of ordinary income over ordinary expenditure of £315,420, whereas the remaining 288 hospitals had an excess of expenditure over income of £390,398. In 1921 the percentage of hospitals showing an excess of income was 51 per cent., while the percentage of hospitals which failed to make ends meet was 49 per cent.

This short preliminary account of some of the most striking features of the report will be sufficient to indicate that it is of great interest to the medical profession. We hope more fully to discuss in future issues some of the many points contained in the body of the report.

[1] British Red Cross Society, 19, Berkeley Street, London, W. Price 1s.

THE BRITISH EMPIRE CANCER CAMPAIGN.

WE mentioned last week that a discussion had taken place between representatives of the British Empire Cancer Campaign and of the Royal Society and the Medical Research Council with regard to the organization of the scientific side of the campaign, and that it had been decided to form an advisory committee if the necessary agreement upon details could be reached. We had assumed that negotiations would proceed between the two parties in order to reach a full agreement on all details, but we learn from a statement in the *Times* that at a meeting of

the Grand Council of the Campaign held on July 16th the principle of appointing a scientific advisory committee was accepted, and that apparently it has gone further than this and has proposed that the committee shall consist of ten persons—five to be nominated by the Royal Society and the Medical Research Council jointly, and five by the Grand Council. Whether the suggestion will be acceptable to the Royal Society and the Medical Research Council we have no means of knowing. The report presented to the annual meeting of the Imperial Cancer Research Fund on July 17th contained a summary account of the negotiations that have been going on since April between the Fund and the promoters of the Campaign. It was laid down that the complete independence and individuality of the Fund must be maintained, and that it could not associate itself with the Campaign unless other cancer research institutes were invited to take part and assured of receiving financial support. The result of an interview in May with Mr. G. Locker-Lampson, M.P., Honorary Secretary of the Committee of the Campaign, was not deemed satisfactory, and it was then decided that it would be inadvisable for the Fund to participate in the campaign. Since then the executive of the Fund has been informed that the promoters of the Campaign have recognized the necessity of modifying its articles of association. Speaking at the meeting on July 17th the Duke of Bedford, President of the Fund, said that the modifications proposed included the appointment of an Advisory Committee which it is hoped will comprise members nominated jointly by the Royal Society and by the Medical Research Council. "In the event of these modifications being carried out," the President continued, "they would, I think, secure the confidence and co-operation of bodies, including the Imperial Cancer Research Fund, which have been for many years past engaged in the work of cancer research, because in their opinion the future administration of the British Empire Cancer Campaign would then be guided by those whose knowledge would enable the best use to be made of all funds available. It is therefore obvious that the adhesion of this Fund to the British Empire Cancer Campaign must be dependent upon the decision of our Executive Committee when the revised articles of association in their final form have been fully considered. It is very certain from letters and articles which appear from time to time in the press that incredibly little is known of the work that has already been done by our Fund and by other research bodies, both in this country and in the rest of the world—for instance, the information collected by the Imperial Cancer Research Fund relating to cancer in native races throughout the Empire, and of its occurrence in all species of the animal kingdom. For this reason it would seem to be essential that the administration of the funds of the Campaign should be in the hands of those who know what experimental work has already been done, and what information on the subject has already been accumulated. By these means useless repetitions would be avoided and public money used to the best advantage. The annual report of the Imperial Cancer Research Fund shows that it has continued to pursue its considered policy of co-operation in the free and friendly intercourse between the workers in different laboratories, coupled with the interchange of material. In conclusion let me add that I believe that such co-operation and co-ordination must be voluntary. It cannot be forced on the workers."

TREATMENT OF LEPERS.

VISCOUNT CHELMSFORD presided at a meeting held at the India Office on July 12th, when it was decided to form a British Empire Leprosy Relief Association. It was stated that the British Empire has more known lepers than any other political entity in the world, but is doing far less in proportion than is being done by the United States for its lepers. Less than 5 per cent. of the sufferers in the King's dominions, it was reported, are being cared for in any way, and of these, owing mainly to the poverty of the countries most affected—namely, India, tropical Africa, and the West Indies—only a small proportion are receiving the treatment by derivatives of chaulmoogra and certain other oils which has been used with so much success during the last eight or nine years. A general committee was appointed, which includes Lord Chelmsford, Lord Ronaldshay, Lord Riddell, Sir Humphry Rolleston, Sir William Leishman, Sir Havelock Charles, Sir Clifford Allbutt, Sir Archibald Garrod, Sir George Newman, Sir John Rose Bradford, Sir Walter Fletcher, Sir Malcolm Morris, Sir George Berry, M.P., Dr. F. E. Fremantle, M.P., Sir William Edwards, Sir Edward Gait (Member of Council, India Office), Sir William Vincent, Sir Charles McLeod, Sir Rajendranath Mookerjee, Sir Frank Carter, Sir James Michelli, Sir Leonard Rogers, Professor J. J. W. Stephens, Lieut.-Colonel A. Alcock, Lieut.-Colonel S. P. James, Dr. Andrew Balfour, Mr. H. S. Wellcome, Dr. Cochrane, and Mr. F. Oldrieve. An executive committee and subcommittees were appointed to prepare plans for carrying out the objects of the association.

THE MEDICO-PSYCHOLOGICAL ASSOCIATION.

THE annual dinner of the Medico-Psychological Association on July 11th must surely have established a record, at any rate for this country, in the number of speeches—sixteen—accompanying the various toasts. Dr. Edwin Goodall, president of the association, was in the chair, and was in his happiest vein in proposing the health of the sister societies. He described a medical society as a conventicle where the older members of the profession assembled to drink in wisdom from the lips of their juniors. More seriously, a society was a means of exchanging medical experience, exposing new lines of research, presenting new facts, and promoting good manners among the followers of a profession who in their daily work sometimes indulged in asperities with regard to one another. He recited a formidable list of the medical societies now existing in London, and made a good deal of play at the expense of that "hydra-headed monster" the Royal Society of Medicine, against whose absorptive capacities, however, he was glad that the Medico-Psychological Association had remained proof. Sir Humphry Rolleston, Mr. H. J. Waring, Sir W. Hale-White, and Dr. Henry Cotton of New Jersey responded to the toast, the last named expressing the indebtedness of American psychiatrists to their British colleagues. Dr. Percy Smith gave the toast of the Legislature, and the Earl of Onslow, in replying, referred at some length to the Mental Treatment Bill. He dated the new spirit in legislation and administration with regard to the insane to the quite recent transference of the Board of Control from the Home Office to the Ministry of Health. Lord Riddell, in acknowledging the toast, pictured a well organized municipality having, in addition to its seven existing inspectors, a mental inspector equipped with rather terrifying powers. Taking up a remark by a previous speaker, Lord Riddell expressed himself strongly against the ban upon professional advertising. He found it difficult as an ordinary man to take an impersonal interest in medical progress. Discoveries would always be associated in the public mind with persons, and Lord Riddell argued that when a medical man made a discovery it was quite good from the public point of view that it should be associated with his name. He did not see why it should be thought discreditable to doctors, within certain limits of decorum, to indulge in indirect

advertising. Sir Sydney Russell-Wells, M.P., who also responded, described the House of Commons as one of the best houses of detention in this country; its keepers were called whips, and if its inmates were allowed out at all they were only allowed in pairs. Sir Eric Geddes, whose important speech came almost at the end of the banquet, spoke on the lack of frankness in the discussion of insanity, the exceptional nature of the treatment, and the financial difficulties in providing the dual treatment, physical and mental, and the special environment necessary to the cure of the mental case. He said that although the Medico-Psychological Association was over 80 years old it would not claim for itself that it had explored more than the fringe of the subject of the cause, prevention, and cure of insanity. During the last ten years the recovery rate appeared to show practically no improvement. There remained a great field of research, alike among cases already in institutions and those not sufficiently advanced to require certification. If the case were put before the public clearly and definitely he was sure that the authorities, national and local, in this country would unloose their purse-strings. The public must be made to realize that a large proportion of the inmates of these institutions, constituting an inevitable drag on the utilitarian part of the population, could be cured, but that the possibilities of investigating each case on scientific lines were limited by lack of funds for education and research, so that those concerned could do little more than trust to Nature and environment to remedy what they knew might be remedied with more speed and certainty by scientific means. Apart from what might be called the physical side of the treatment in disease of septic or toxic origin, and the removal of nerve strain and shock, there was also a field which to himself as a layman appeared almost unexplored—that, namely, which awaited the psychiatrist.

MEDICAL SERIALS IN BRITISH LIBRARIES.

LAST week reference was made (p. 73) to the list of periodicals in medicine and the allied sciences prepared by Professor R. T. Leiper, F.R.S., Professor of Helminthology in the University of London, with the collaboration of Mrs. H. M. Williams and Miss G. Z. L. Le Bas, M.Sc., and it was stated that the British Medical Association, impressed by the need for such a guide to the principal medical libraries in Great Britain, had subsidized the preparation of the work and was about to publish it in a volume. We have now received an early copy of the volume, which makes a very handsome appearance. The periodicals noted are classified geographically: English-speaking countries and their possessions (pp. 1-72), French-speaking countries and their possessions (pp. 73-102), Teutonic countries (pp. 103-148), Slavonic countries (pp. 149-159), Scandinavian countries (pp. 160-166), Latin countries, including Italy, Portugal, Spain, Mexico, and South and Central America (pp. 167-186), and other countries, including Greece, Turkey, Japan and China (pp. 187-190). The main object has been to save the time of persons desiring to consult the very scattered literature, especially of the sciences allied to medicine. Professor Leiper has dedicated it "To those who have made the weary pilgrimage of London's Libraries," but, as has been said, the list embraces also the libraries of Oxford, Cambridge, Liverpool, Manchester, Edinburgh, and Glasgow. The aim has been to make an approximately complete list of periodicals, including serials of learned societies available in Britain. Over 4,700 periodical publications are included, and it is hoped that few important titles prior to 1921 have been omitted. The list indicates not only the name of the periodical and of the libraries in which it is to be found, but also the range in each library, whether complete or between certain dates only. The book will, we believe, serve its purpose and prove most useful to inquirers. Its price is 10s. 6d. and it can be obtained through any bookseller, but it will be supplied post free by the Financial Secretary of the British Medical Association, 429, Strand, London, W.C.2., at the price of 10s. 9d. Copies will be available at Stand No. 64 of the Exhibition of the British Medical Association which will be held during the Annual Meeting next week at Portsmouth.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

AT the quarterly meeting of the Council of the Royal College of Surgeons of England on July 12th, Sir John Bland-Sutton was elected President in succession to Sir Anthony Bowlby, who had held that office for three years. At the same meeting Sir Berkeley Moynihan, Bt., professor of clinical surgery in the University of Leeds, and Mr. H. J. Waring, surgeon to St. Bartholomew's Hospital and Vice-Chancellor of the University of London, were elected vice-presidents. Sir John Bland-Sutton, who became M.R.C.S. in 1882 and F.R.C.S. in 1884, was surgeon to the Middlesex Hospital from 1886 to 1920, when he was appointed consulting surgeon. He was President of the Royal Society of Medicine in 1921, and last January gave the Hunterian oration before the Royal College of Surgeons, of which he was then vice-president. He gave the Address in Surgery before the British Medical Association at the Annual Meeting at Aberdeen in 1914; in the course of this address, which dealt with the surgeon of the future, he said: "It requires little foresight to recognize that for men ambitious to attain high places in surgery the high road lies through the pathological institute." Of this truth he is himself a living example, and one evidence of his faith is afforded by the Bland-Sutton Institute of Pathology at the Middlesex Hospital. It was built and equipped by him in 1914, and through it all the departments of the medical schools are brought into touch.

OPENING DOORS.

THIS is the title of a little book[1] written by Dr. John Thomson "for the mothers of babies who are long in learning to behave like other children of their age." The author first describes the way in which the mind of the normal infant develops, so that the mother may know "when the baby's brain is growing properly"; then he shows how she may know "when the baby's brain is not growing as fast as usual"; and lastly he instructs her as to what she can do to bring about an improvement. Many excellent books have been written giving advice to mothers; Dr. Thomson does not merely give good advice, but he gives it with insight and kindliness. Written in very simple language, this unpretentious book is pervaded by that indefinable charm which we find in a work of art and scarcely hope to discover in a book of medical advice. Dr. Thomson shows an appreciation of the fact that where a mental defective is found in the home the physician has not merely to treat a case, but has to deal also with a painful and delicate domestic situation. The feelings of the parents have to be considered, especially in the early days when they dimly begin to recognize that the baby's mind is not developing properly. Dr. Thomson has not thought well to refer directly to this aspect of the situation, but every line reveals a sympathetic insight into the mother's feelings; for this reason not only will the mother of a defective find this book help her "to open the doors of her child's mind," but she will find

[1] *Opening Doors.* By John Thomson, M.D. Edinburgh: Oliver and Boyd. 1923. (Pp. 20. Price, in cloth 1s. 6d.; in paper, 6d.; and in quantities for distribution (paper) 25s. per 100.)

it a source of comfort and encouragement as well. Parents can scarcely be expected to be anything but very sensitive when they find something wrong with a child on whom, perhaps, their hopes and ambitions were centred. Sometimes they will endeavour to stifle their fears; they may shut their eyes to obvious defects and find evidence of intelligence in the simplest biological reactions. It is, of course, much better that they should face the situation, though it is quite natural that they should be reluctant to do so. They may find that their fears are exaggerated, for, as Dr. Thomson points out, "some babies whose outlook to begin with seemed almost hopeless, improve far more than could have been expected, and do wonderfully well in the long run." In any case, as he repeatedly insists, the mother herself can do a great deal to bring about an improvement, and the earlier she begins the better. All mothers with defective children will find his book most useful; we can commend it also to social workers and medical practitioners because, though the advice is couched in simple language, it is given by a writer with a profound knowledge of children.

PROTECTION OF CHILDREN.

AMONGST bills with which Parliament is unlikely to be able to proceed during the present session is the "Children, Young Persons, etc.," Bill. It has been introduced by Mr. Ammon and a group of Labour members, and despite its barbarous title deserves more public attention than it has hitherto received. The bill is primarily a measure of consolidation, covering existing provisions for the protection of children and young persons, a section of the Statute Book urgently in need of revision. But the feature to which we would more particularly direct attention is the attempt to extend and strengthen existing enactments at certain points. Clauses 1 and 2, based on provisions in the Indian Penal Code, extend the law of homicide for the protection of a child which has partly issued from the mother's womb, and makes it a felony punishable by penal servitude up to ten years to cause the death of an unborn child—that is, a child no part of which has issued from the body of its mother—by an act amounting to criminal homicide if directed against a person. Part II would strengthen the provisions of Part I of the Children Act relating to infant life protection by requiring notice of reception of an infant apart from its parents to be given in all cases, although the period may be less than forty-eight hours, by bringing "relatives" in cases of illegitimacy within the provisions of the Act and by raising the age limit for special protection to 10. The Minister of Health is empowered to require local authorities to enforce the several provisions of the Act, and the right of the local authority to exempt particular premises from visitation is withdrawn. Powers and duties under this part of the bill are confined to County Councils and County Borough Councils, except within the administrative county of London. Section 12 of the Children Act, 1908, is revised, and the maximum penalties for cruelty to children and young persons are increased. The age of competence to marry is raised to 16 for both boys and girls.

DISSENSIONS AMONG ANTIVACCINATORS.

THE hotheads amongst the antivaccinators have once more been defeated, and the threatened disruption for the present averted. The *Vaccination Inquirer* of July 2nd contains a belated report of an animated scene at the annual meeting of the National Antivaccination League held in London on May 2nd. An over-zealous section of the members appears to be causing considerable anxiety to the more sober-minded followers. The trouble arose through the reintroduction of the following resolution, which had been proposed but not adopted at the previous annual meeting: "That principle and policy alike demand that the National Antivaccination League should work for the entire prohibition of vaccination instead of the abolition of compulsory vaccination." The mover of the resolution made a fierce onslaught on the medical profession, describing doctors as "unmitigated scoundrels." Vaccination, he declared, was "organized blackmail." Two speakers, both laymen, protested against this onslaught on the medical profession. Several doctors were present and spoke, but the report contains no protest from them. Most of the speakers appear to have strenuously opposed the resolution, on the ground that it would "split the league," and that it was opposed to the liberty of the subject. Others threatened to leave the league, and others again urgently suggested that the resolution should be withdrawn. Eventually, however, a vote was taken and the resolution defeated. Thirty-seven voted against, seven in favour, and four or five persons present did not vote. The discussion reveals the real nature of the fight of the older stalwarts of the league. It has been with them for the most part a fight for people to please themselves whether they would submit their children to vaccination. In the present state of the law that liberty is conceded. Now that the chance of winning a crown of "martyrdom" has gone there seems much disappointment among a section of antivaccinators, and objection is taken to the conscience clause because it has removed the possibility of being sent to prison for refusal. It was remarked at the annual meeting that "the conscience clause has split up our society," and that the former organizing secretary went to prison "not because he was forced to go but because he knew that by doing so he would benefit the cause." Thus it came about that a resolution was submitted and carried by a majority of one (ten to nine): "That this meeting recommends all in a position to do so to refuse payment of that portion of the poor rate which is devoted to paying the expenses of vaccination, and pledges the full support of the league to all who do so." As an alternative to this recommendation, how would it be to suggest that the expenses of epidemics of small-pox should be paid by antivaccinators?

TO ENCOURAGE RURAL DOCTORS.

A SOLUTION to the difficulty of providing medical care for rural communities is suggested in the *Journal of the American Medical Association* (June 30th, 1923, p. 1930). The belief is expressed that any community that can support a medical practitioner can get one if its citizens are willing to pledge themselves to guarantee an income of 2,500 to 3,000 dollars (about £500 to £600 a year), and to interest the community in the support of the practitioner. This plan has worked out satisfactorily in a Middle West community, where the practitioner selected secured from his practice an income larger than the amount pledged, so that the guarantors were not called upon. The chief arguments advanced in favour of the plan are, first, that as the people of the community have a voice in the selection of their medical attendant, and as they have pledged themselves to his support, they will be disposed to consult him rather than practitioners in distant towns; and secondly, that young practitioners at the time they complete their medical training will be attracted to places where a reasonable income is guaranteed. In New Hampshire a law has just been passed which permits any town to appropriate sufficient money to support a resident medical practitioner when the town cannot otherwise obtain one.

INTERNATIONAL CONGRESS OF SURGERY.

INAUGURAL SESSION.

THE inaugural session of the sixth triennial meeting of the International Surgical Society took place at the Royal Society of Medicine on Tuesday morning in the presence of H.R.H. the Prince of Wales, the President of Honour. Sir William Macewen, President of the Society, occupied the chair, and the following, in addition to the Prince, were on the platform: The Marquess Curzon of Kedleston (Secretary of State for Foreign Affairs), Mr. Neville Chamberlain, M.P. (Minister of Health), Professor Willems of Liége (President of the International Committee), Surgeon Vice-Admiral Sir Robert Hill (Director-General of the Medical Department of the Royal Navy), Air Commodore D. Munro (Director of Medical Services, Royal Air Force), Sir George Newman (Chief Medical Officer, Ministry of Health), Sir Humphry Rolleston (President, Royal College of Physicians), Sir John Bland-Sutton (President, Royal College of Surgeons), Sir W. Hale-White (President of the Royal Society of Medicine), Sir W. I. de Courcy Wheeler (President of the Royal College of Surgeons in Ireland), Mr. H. J. Waring (Vice-Chancellor of the University of London), Lord Dawson of Penn, Mr. James Berry, Sir Anthony Bowlby, Dr. Leopold Mayer (General Secretary of the International Surgical Society), Dr. Jules Lorthioir (General Treasurer of the Society), Sir D'Arcy Power and Mr. J. E. H. Roberts (Secretaries of the meeting), and Mr. Percy Sargent (Treasurer).

His Royal Highness was received by the President of the Royal Society of Medicine, Sir William Hale-White, and signed the roll of the Society as an Honorary Fellow. He was then received by Sir William Macewen, and several presentations were made. The following national delegates were presented to the Prince:

Dr. Bruce (Canada), Dr. Presno y Bastiony (Cuba), Dr. Zahranicky (Czecho-Slovakia), Dr. Hansen (Denmark), Dr. Petridis (Egypt), Professor Hartmann (France), Dr. Koch (Holland), Dr. Alessandri (Italy), Dr. Nicolaysen (Norway), Dr. de Zawadski (Poland), Dr. Bastos (Portugal), Dr. Bartrina (Spain), Dr. Kayser (Sweden), Dr. de Quervain (Switzerland), and Dr. MacArthur (U.S.A).

The PRINCE OF WALES said that he greatly appreciated the honour of being asked to declare open the sixth triennial meeting of the International Surgical Society, held this year in London under the patronage of His Majesty the King. The meeting was held in a building (that of the Royal Society of Medicine) in which he did not speak entirely as a stranger, because he had just signed the roll as one of the Honorary Fellows of the Society. He recalled that when the Society had met in Brussels, King Albert had shown great personal interest in its success, and opened its first session in 1908. It was a great pleasure (the Prince continued) to welcome these distinguished surgeons to England, the country of Lister, who revolutionized the whole art of surgery by his practical application of the discoveries of Louis Pasteur—a splendid instance of the value of international co-operation in science. (Applause.) He was also very glad to extend a welcome to the last President (Professor Keen of Philadelphia), who, in spite of the eighty-six years he carried so lightly, and the weight of a world-wide reputation, was again amongst them, ready as always to take part in every meeting, social as well as scientific, of that distinguished gathering. He had further to welcome Sir William Macewen, pioneer of surgery of the brain and the bone, who was well worthy of the office of President. Finally, he welcomed once again the many leading surgeons of the world who had come into their midst, and he trusted that further progress in the art of relieving pain and prolonging life might result from their deliberations. (Applause.)

The MARQUESS CURZON OF KEDLESTON said that he had been asked to join in the welcome because this was an international body, and it was fitting that the representative for foreign affairs in His Majesty's Government should have the opportunity of saying how pleased he was that this gathering was being held in London. International meetings, with whatever branch of science or art they might deal, were parts of the great machinery for preserving the energy of the world. In the world of science rivalry might exist; hostility was unknown. There were no such hostilities as he had to deal with daily at the Foreign Office. Those present met on the common platform of an allied interest in the great problems the solution of which made for the benefit of mankind. No doubt in the course of their stay in London the visitors would go to the Houses of Parliament, where daily our legislators were engaged in dealing with the maladies of the body politic. He only wished they could apply to those maladies one-tenth part of the skill, one-hundredth part of the knowledge which surgeons applied to the conditions they had to treat. He described the Foreign Office as the operating theatre of the British Empire; at that moment he himself was applying the scalpel to some of the most unpleasant—he might almost say diseased—conditions of the body politic of Europe. He sympathized with those present in their undertaking; he prayed them to sympathize with his.

Mr. NEVILLE CHAMBERLAIN said that as Minister of Health he rejoiced to meet that gathering. In the whole field of international co-operation there were no more striking results and no more transcendent benefits to the human race than were to be found in surgery. The almost incredible advances made during the last half-century sprung from two great discoveries which were international in charactor—first of all, the discovery of anaesthetics by Morton, an American, and Simpson, a Scotsman; and secondly, the establishment by Lister of antiseptic surgery based upon the revolutionary researches of the great Pasteur. Upon those two pillars had been reared the whole edifice of modern surgery, and it was impossible to over-estimate the benefits it had conferred upon mankind. One of the rare consolations arising out of the great war was the wonderful advance in surgery in response to the demands made upon it. The conditions were unprecedented, but the response was immediate. The horrors of that great struggle would be gradually forgotten, but it might be hoped that the perfected modes of surgical procedure would remain as a permanent contribution to the relief of human suffering. To anyone who occupied his position there was one thing even more important than the cure of disease, and that was its prevention. To him as a layman surgery appeared essentially preventive in its nature. The State was like a hive of bees—the drones must never be allowed to outnumber the workers. Anyone who by reason of bodily infirmity was not able to make his full contribution to the service of the community was a drone, a parasite, a burden instead of a source of wealth and strength. Surgery was daily converting drones into workers, and thereby placing the community in its debt.

Mr. J. E. H. ROBERTS, F.R.C.S., as British delegate, welcomed the visitors from overseas, and thanked them for the honour they had done British surgery in choosing London as the centre for their sixth international meeting. Although the meeting was held in London, it was the surgeons of the whole of the British Isles who welcomed the visitors, and who hoped to be able to return in some small part the hospitality which had been shown them on previous occasions in Europe and in America.

Professor WILLEMS (Liége), as President of the International Committee, expressed the thanks of the gathering to the Prince of Wales, to the members of His Majesty's Government, and to the members of the British Committee, particularly the Honorary Secretaries, Sir D'Arcy Power and Mr. Roberts, who had taken charge of the organization of the Congress and had arranged for the visitors a cordial and brilliant reception. It was the first time that the International Congress of Surgery had met under the leadership of a surgeon belonging to the country in which the meeting took place. The previous five congresses had been held, three in Brussels, one in New York, and one in Paris, and on each occasion the president had been a foreign surgeon. It was that day the

speaker's very pleasant privilege to extend the congratulations of the International Committee at once to Great Britain and to one of the greatest of British surgeons—to Great Britain, the generous nation, whose splendid soldiers spilled their blood on Flanders ground in defence of right and civilization; and to Sir William Macewen, the illustrious surgeon, whose name was universally known, and to whom he was glad to offer a tribute of admiration and respect. Speaking for the visitors, he said that they were very happy and proud to visit the British surgeons. During the war British surgery took a large part in the renovation of surgical methods, and gave several proofs of its well-known originality, and its careful and ingenious technique.

Dr. LEOPOLD MAYER (delegate from the Belgian Government), who spoke in French, referred to the recent visit of the Prince of Wales to Belgium. His Royal Highness, in honouring the Society with his presence, had doubtless wished to show that he had not forgotten it was in Brussels twenty years ago that the Society was founded, and that its standing committee was composed of Belgians. He also, in thanking the Ministers who had welcomed the gathering, referred to the cordial relationship which existed between Great Britain and Belgium. Since the last congress there had been heavy losses in their ranks by death; he referred particularly to the death of Sir Charles Ryall, who had helped to lay down the lines on which the present meeting was to be held. He thanked Mr. Roberts and Sir D'Arcy Power for the amount of work and thought they had put into the arrangements for the gathering. He mentioned that at a meeting of the International Committee held the previous afternoon 184 new members were admitted to the Society, bringing the total up to 748, representative of twenty-eight nations. Certain alterations in the statutes would be submitted in order to prevent the financial position of the Society being seriously compromised by the disorganization of the exchanges. Contrary to the usual custom, the scientific sessions at the present meeting would take place in the mornings, leaving the afternoons to be devoted to visiting hospitals, laboratories, and university institutions, but this would not mean that the scientific sessions would be shortened or ill-attended. In conclusion he welcomed certain representatives in particular—those, namely, from Jugo-Slavia and Czecho-Slovakia, from Russia, and from Latin America—and paid a tribute to the Presidents of the sixth and the fifth congresses Sir William Macewen, whose qualities were very eminent, and Professor Keen of Philadelphia, whose activity and alertness seemed to belie the fact that on the previous day he had entered upon his eighty-seventh year.

Sir WILLIAM MACEWEN then delivered his presidential address, the Prince remaining until its conclusion. The address was received with much acclamation. It is published in full at page 91.

DISCUSSIONS.

SURGERY OF THE ENDOCRINE GLANDS.

The first meeting of the International Congress of Surgeons dealt with the surgery of the endocrine glands and from this debate the thyroid was excluded. A large field was thus given to the reporters, a field perhaps too vast for adequate discussion.

Dr. VEAU, of Paris, first spoke on the surgery of the thymus in early infancy. Three types of surgical intervention had been practised in hypertrophy of the thymus. Rehn, Koenig, and Deneké, had contented themselves with fixing the organ in the substernal space. Results had not been satisfactory, perhaps because respiratory movements were too great. The next type of operation was a resection of the manubrium sterni with or without thymectomy. It was important to consider the question of the removal of the gland in these cases. Dr. Veau did not think that resection of the bone without thymectomy was justified. It had never been proved that the trouble caused by a hypertrophied thymus was due only to an antero-posterior compression. Removal of the manubrium after thymectomy should be reserved for those cases in which it had been impossible totally to resect the superior pole of the adherent gland. Subcapsular thymectomy—an easy and not a dangerous procedure—should be the only routine operation in cases of enlarged thymus. The results of the operation were excellent. In spite of the desperate condition of many of the patients he could never remember a case of immediate post-operative mortality. Thirty per cent. of the infants were dead a month after the operation. This mortality must be carefully considered; deaths were due to several causes. In babies who had been submitted to a previous tracheotomy there was a great danger of infection of the wound. In cases of dyspnoea of unknown cause a blind tracheotomy should never be done. "If it is necessary to operate, do a thorough operation and see what you find." Bronchopneumonia was another cause of death. Care must be taken not to operate wrongly on children with tuberculous glands. If this were done generalized tuberculosis followed. Again, infantile diarrhoea sometimes caused a fatal issue. There were three main symptoms of an enlarged thymus—permanent dyspnoea, crises of suffocation, and stridor. In two-thirds of cases the dyspnoea was immediately cured by operation; in four-fifths the suffocation disappeared; the stridor was less amenable to treatment. It was a habit and only gradually disappeared. Ablation of the thymus did not interfere with growth. Nor should it, for only the superior poles of the gland were removed. The operation was a good and simple one. However, another therapeutic agent was at hand. *X*-ray treatment cured these babies without operation; the rays could be applied blindly—they seemed to do no harm. If a doctor was even suspicious of a hypertrophied thymus, his duty was to send the patient to a radiologist. Then the diagnosis was less important. A thymectomy ought not to be done like an exploratory laparotomy. One or two points in connexion with radiotherapy should be noted. Occasionally it was ineffectual. If after one or two applications the symptoms persisted, thymectomy should be done. It was said that grave events sometimes followed the application of the rays. After six, seven or eight hours symptoms suggesting infantile cholera developed. The child became cold, a little dyspnoeic, and sometimes had bad diarrhoea. The periphery was cold; there was a high central temperature. *Post mortem* one found the gland had disappeared. Sometimes there were symptoms of a mild meningitis. These cases were so rare that they should not prevent *x*-ray treatment; but till the effects of the rays were proved by time the surgeon must not imagine his work on the thymus finally completed. There was, moreover, for him always the urgent case of the child near asphyxiation in whom the cervical incision had displayed a hypertrophied thymus.

Although Dr. LORTHIOIR of Brussels did not speak next, it will be of interest to take his remarks at this point. The physiology of the thymus was, he said, still largely a matter of conjecture. Probably it was related in some way to growth. The indications for operation he believed to be many. Thymic asthma—too well known to need description—respiratory insufficiency, atrepsy, general debility, all called for thymectomy. There was an analogy between ablation of the thymus and of adenoid vegetations. The time would come when thymectomy would be practiced as frequently as the removal of adenoids is now accomplished. The operation was simple. Any anaesthetic could be used—he usually advocated chloroform. Considerable care must be taken in advising the drug. The local anaesthetic was impossible in a baby. The submembraneous enucleation of the gland was the most difficult part of the operation, which could be total or subtotal. There should be practically no bleeding. He believed that the *x* rays affected other structures besides the thymus and were thus dangerous. They should remember that the operative mortality was nought.

Dr. W. J. MAYO, of Rochester, U.S.A., discussed the splenic syndrome. From the time when the Greeks were supposed to have removed the spleen from their long-distance runners there had not been, till recently, any great advance of knowledge in its functions. It was now known that the spleen was concerned with the blood and was closely associated with the liver. It was chiefly a mechanical filter removing from the blood degenerated red cells and toxic agents above colloid size. Such were micro-organisms and débris on which it acted before sending them to the liver for further detoxication and elaboration. It also

developed lymphocytes. It might have as one of its functions the removal of oxygen from the blood, so preparing it for the action of the liver upon it. While the function of the normal spleen was unimportant, the diseased spleen was a serious menace to the constituents of the blood and to the liver. The action of the spleen might perhaps be biophysical rather than biochemical. It did not initiate the pathological processes in which it was concerned, but acted as a secondary agent. Removal of the organ in the splenomegalous and in certain blood diseases removed a pathological agent or broke up a vicious circle. In the estimation of the benefit to be derived from its removal the entire syndrome of which it was a part must be considered. A chronically enlarged spleen which did not yield to reasonable medical treatment should be removed early unless in the individual case there were contraindications to splenectomy.

SUMMARY OF 304 SPLENECTOMIES.

The number of splenectomies performed in the Mayo Clinic for various conditions up to June 1st, 1923, was 304. All deaths occurring in the hospital are classified as due to the operation, without regard to the length of time following operation, or to the cause of death.

Splenomegalias due to Micro-organisms.—(1) Syphilis, chronic, 8 splenectomies, 1 death in hospital, good results in 7; (2) tuberculosis, 4 splenectomies, 1 death in hospital, good results in 3; (3) pyogenic organisms, 15 splenectomies, 4 deaths in hospital, good results in 6; no patient with septic endocarditis was cured; (4) splenic anaemia, 85 splenectomies, 11 deaths in hospital, good results in the great majority of the remainder. A number of the patients who made good recoveries had typical Banti's disease with advanced portal cirrhosis. Ten patients had gastric haemorrhages during the first six years following operation, and died directly or indirectly from that cause.

Haemolytic Icterus.—Forty-four splenectomies, 1 death in hospital; 40 patients recovered perfectly; 60 per cent. of the patients had coincident gall stones which required operation.

Pernicious Anaemia.—Fifty-seven splenectomies, 3 deaths in hospital, no deaths among the last 38 patients prepared by blood transfusion. The improvement in all was much more prolonged than that following blood transfusion alone. Over 10 per cent. of the patients lived more than 5 years following splenectomy, and over 22 per cent. more than three years following splenectomy. There were no cures, but the abnormal blood picture improved. Splenectomy in pernicious anaemia is justified in only a limited number of carefully selected cases. Elderly patients with advanced conditions and aplastic types of the disease should not be considered for surgical treatment.

Polycythaemia Rubra Vera.—One splenectomy, great improvement; the patient is able to work more than former years.

Haemorrhagic Purpura (Essential Thrombopenia).—One splenectomy, in advanced stage of disease; good recovery.

Splenomyelogenous Leukaemia.—Twenty-nine splenectomies, 1 death in hospital, great temporary benefit in 28. Six are alive and able to work, one more than 6 years following operation. The condition of the blood is improved, but not normal. There is less anaemia and less evidence of toxemia in splenectomized patients.

The 61 miscellaneous cases, many of which had not been accurately classified, were not discussed in this paper.

Dr. Ch. WILLEMS of Liége, (who spoke), and Dr. N. GOORMAGTIGH, of Ghent, next presented their report on the surgery of the suprarenal capsules. The two parts of the suprarenal gland were morphologically, functionally, and embryologically distinct. There were two main groups of suprarenal tumours—those of cortical and those of medullary origin. The speaker would call the first cortico-suprarenalomata. This was better than the term "hypernephromata" which had been first reserved for the tumours of Grawitz and had now spread to include all tumours of cortical origin and even of some formed from medullary tissue. Amongst cortico-suprarenalomata there were:

(1) Simple hyperplasias, which Virchow called "strumae lipomatosae suprarenales."

(2) Cortico-suprenal adenomata, usually very small, well defined, and sometimes formed of clear vacuolated cells, charged with lipoids—clear-celled adenomata, another type was composed of darker cells, sometimes pigmented, situated deeply in the cortex—dark-celled adenomata. These adenomata often underwent cystic degeneration.

(3) Cortico-suprarenal carcinomata. The close connexion of these tumours with the vessels had led certain authors to call them peritheliomata. Their clinical course betrayed their character rather than their histological structure.

(4) Carcinomatous cortical tumours tending towards sarcomatous transformation. Against the cortical group might be placed the tumours of medullary origin. These tumours were of two separate origins and types, for two kinds of tissue existed within the suprarenal medulla. They were (*a*) of sympathetic nervous origin; (*b*) of paraganglionic origin. Of tumours of sympathetic origin there were several types: the neuroblastomata or neurocytomata; the ganglio-neuromata; tumeurs sympathiques, melaniques. The tumours of paraganglionic origin were rarer than cortico-suprarenalomata. Histologically these had the appearance of chromaffin tissue; they were essentially innocent and often underwent cystic degeneration. Peyron had called them innocent adenomatous paragangliomata. Only one case of malignant paragangliomata had been described. The cortico-suprarenalomata were by far the most frequent of all these tumours. They were found at any age. The whole group profoundly affected the secondary sexual characteristics. In embryological life they led often to pseudo-hermaphroditism. In babies they led to precocious development of the external genital organs, and in girls to a tendency towards masculinity. In the adult woman the tumours accompanied a progressive masculinization; a beard or moustache might appear, there was shrinking of the breasts, the contour of the thighs became masculine. In man there was testicular atrophy and swelling of the breasts. More frequently these cortico-suprarenalomata showed less definite symptoms, they remained latent and could not be palpated. In infants orbital metastases showed an oedema or palpebral ecchymoses, often thought at first to be due to trauma. In the adult the metastases showed a remarkable predilection for bone. Little intracortical adenomata were often only found at autopsy. Neuroblastomata were congenital or found only in infants. They were frequent and malignant. Ganglio-neuromata were much rarer and appeared at any age. They were not accompanied by any special symptoms and in children often gave metastases in the liver and in the lymphatic glands. Paragangliomata were generally found at autopsy. Only the laborious progress of endocrinology would elucidate the symptoms of these tumours.

Whatever might be the opinion of the physiologists as to the signification of adrenaline in the physiology of the suprarenal, the clinicians continued to admit the suprarenal insufficiency resulting from a total deficiency in the suprarenal functions, and not a deficiency of adrenaline alone. Moreover, the symdrome of Sergent-Bernard presented an acute form, corresponding to the destruction of the glands, and a lighter form which corresponded probably to partial lesions and was still a matter for controversy. The acute form had the appearance of an intoxication, while the chronic form presented as principal symptom the hypotension and the asthenia. This syndrome showed the alteration of the gland without giving any information as to the nature of this alteration. The excision of one of the healthy suprarenals, with the idea of lessening the amount of suprarenal substance, had been performed, especially for epileptic fits, according to the opinion of some physiologists who think that these convulsions do not depend upon the nervous central system, but upon the endocrine glands. The results obtained were interesting, but the problem was far from being solved. The removal of the suprarenal gland had also been performed in cases of hypertension, so as to reduce the suprarenal functions. Of the two ways which had been used for the extirpation of the healthy suprarenal, the transperitoneal one was not the widest, in spite of its appearance. The retroperitoneal way, according to the technic of the speaker, was more advisable, being more accurate and giving the required view.

Mr. PERCY SARGENT discussed pituitary surgery. He would, he said, try to point out the lessons he had learnt from personal experience. What might an operation be expected to do? It might (1) bring about some change in the secretion of the gland and so relieve symptoms due to disordered metabolism; (2) relieve symptoms due to pressure of an enlarged gland upon neighbouring structures, particularly the optic nerves and chiasma; (3) relieve symptoms of increased intracranial pressure. The activities of the gland might be affected by functional disturbances of obscure origin as in acromegaly; by being the seat of hyperplasia or neoplasm; by injury; by adjacent growths, or by pressure of intra- or extra-ventricular cerebro-spinal fluid. Surgical intervention upon the function of the gland had had little success. The surgeon could do more by relieving local pressure. "Removal" in speaking of the pituitary meant partial removal. Removal then helped the symptoms. Visual deterioration and the headache, whether "bursting" or more ordinary in type, became less marked. Simple temporal decompression relieved the intracranial pressure. The causes of failure, in his experience, were:

1. Errors of diagnosis leading to misdirected operations.
2. Massive intracranial extension of the tumour rendering the case unsuitable for any operation save a palliative decompression.

3. Operative accident.
4. Post-operative pituitary toxaemia.
5. Post-operative pneumonia.
6. In trans-sphenoidal operations septic infection.

Mr. Sargent advocated the frontal approach to the gland.

Dr. SERGE VORONOFF said that in the Collége de France he had been able to obtain durable ovarian, thyroid, and testicular grafts. Recently he had become interested in testicular grafting in men. Owing to the difficulties of obtaining human graft material he had utilized the testicles of chimpanzees and cynocephalic monkeys. Since 1917 he had been seeking a method to ensure long survival of the grafts. Many experiments on animals had been made. At present he had three cases dating back two years and nine months; two cases dating back two years and seven months; and one case dating back two years and eight months from operation. In all these cases the effects of testicular hormone artificially obtained by grafting was very apparent. Not only was there a subjective appreciation by patients, but such physiological phenomena as lowered blood pressure, loss of weight in obese subjects, production of better vision in hypermetropic subjects through increased tonicity of the lens and accommodative muscles, new growth of hair, etc., had been demonstrated. The size of the gland, or piece of gland, transplanted was important. Early he found that an entire testicle would not grow. Then he went to the other extreme and put in minute pieces. These were absorbed. Now he divided a testicle into six pieces and grafted three of the lamellae on to the visceral surface of one tunica vaginalis, and three on to the other. These were successful. All aseptic precautions were taken. Testicular grafts from young monkeys had not been successful; the animal must be mature. Forty-four of these cases had been done; of these six were doctors. The effects had been put down to auto-suggestion. For three months after the operation there were no appreciable effects. During these three months the doctor patients scoffed. Afterwards they began to appreciate the effects of the treatment.

Mr. IVOR BACK, who has been working in Paris, supported (in English) Dr. Voronoff's contentions. Mr. WALTON advocated the frontal approach to the pituitary gland. Dr. BANTING remarked that insulin helped surgery by getting rid of acidosis and acetone and thereby permitting grave operations on diabetics.

Drs. HENRY (Dublin), KOCHER (Berne), FROELL (Stockholm), Mr. PYBUS (Newcastle-on-Tyne), and others spoke.

[The remainder of the discussions will be reported in our next issue.]

CONVERSAZIONE AT THE UNIVERSITY OF LONDON.

On the evening of Monday, July 16th, a reception conversazione in honour of the Society was held at the University of London. The guests were received in the marble hall by Mr. H. J. Waring, Vice-Chancellor of the University, and Mrs. Waring. The String Band of the Scots Guards played a selection of music in the grand hall, and the galleries of the Imperial Institute were also open. In the library of the university were displayed a number of rare books, including the contemporary manuscript of the life of the Black Prince, which has been placed on permanent loan by the Prince of Wales. The guests, who numbered over six hundred, included, in addition to members of the International Society of Surgery, many representatives of universities and other learned bodies.

PRESIDENT'S RECEPTION.

On July 17th at 8.30 p.m. the President of the Congress, Sir William Macewen, received members of the Congress in the rooms of the Royal Society of Medicine. During the evening the President gave a further discourse, illustrated by lantern slides, on the growth of bone.

LUNCHEON BY THE GOVERNMENT.

The British Government on July 18th entertained at luncheon at the Savoy Hotel a number of members of the Congress, and some others. The Minister of Health was in the chair, and had on his right hand Dr. Willems (Liége), chairman of the permanent Executive Committee of the congress, and on his left Dr. Henri Hartmann, professor of surgery in Paris. After giving the toasts of the King, and of the Sovereigns of the Kingdom and Presidents of the Republics represented, Mr. Neville Chamberlain gave that of "Our Guests" in a short speech in which he referred to the presence of Dr. W. W. Keen of Philadelphia, who was president of the last congress of the International Society of Surgery in Paris three years ago. He touched on what has been accomplished in this country for the health of the people, as evidenced by the decline in the death rate and in the rate of infant mortality, and expressed the pleasure with which the British Government welcomed the representatives of the profession, which in all countries was labouring for the same end. He coupled the toast with the name of Professor Hartmann, who in a brief reply referred to his earliest visit to this country to learn the system of antiseptic surgery introduced by Lister and demonstrated by him at King's College Hospital. The president, Sir William Macewen, proposed in a few words the health of Mr. Neville Chamberlain, who made a brief response.

NEXT MEETING.

It has been arranged that the next congress of the Society shall be held in Poland, at Warsaw, in 1926.

BADGE.

The badge of the congress is a bronze medal having in relief the seated figure of John Arderne, which was reproduced in our columns on December 9th, 1922 (p. 1127), surrounded by the inscription "Int. Surg. Soc. VI. Congress: London, 1923."

Medical Notes in Parliament.

[FROM OUR PARLIAMENTARY CORRESPONDENT.]

Small-pox.

SIR GEORGE BERRY inquired, on July 11th, whether the Minister of Health was satisfied with the manner in which the Vaccination Acts were being administered, and whether, if not, he was prepared to take steps to enforce rigid compliance with them. Mr. Chamberlain said that the responsibility for the administration of the Vaccination Acts rested with the boards of guardians and their vaccination officers. He was not satisfied that the Acts were being properly administered in all districts, and he was considering what steps could be taken to secure improvement in this respect. Dr. Fremantle asked whether the Minister would consider the transference of the administration of vaccination to the general sanitary administration under the sanitary authorities. Mr. Chamberlain replied that this question had been under consideration, but he could not undertake to introduce the necessary legislation during the present session.

The following statistics have been supplied by the Ministry of Health:

No. of Cases of Small-pox Notified in each of the Years 1892-1910 inclusive in certain Large Towns (including London), with a Total Population of such Towns.

Year.	Cases.	Population.	Year.	Cases.	Population.
1892	1,9 9	11,833,279	1902	13,923	18,697,791
1893	10.438	11,894,990	1903	7,383	18,781,337
1894	6,319	12,312,200	1904	5,766	19,845,078
1895	1,949	12,257,700	1905	2,339	20,333,508
1896	2,713	12,769,163	1906	1,020	20,653,699
1897	195	13,035,255	1907	127	21,050,550
1898	1,561	13,128,484	1908	22	22 189,310
1899	931	13,128,484	1909	87	20,029,880
1900	486	13,244,357	1910	108	21,662,6.2
1901	1,980	15,555,319			

No. of Cases of Small-pox occurring in England and Wales in each of the Years 1911-1922 inclusive.

Year.	Cases.	Year.	Cases.	Year.	Cases.
1911	289	1915	93	1919	311
1912	121	1916	159	1920	280
1913	113	1917	7	1921	336
1914	65	1918	63	1922	973

Percentage of Vaccinations to Births in Each of the Years 1892-1921 (inclusive).

Year.	Percentage.	Year.	Percentage.	Year.	Percentage.
1892	74.5	1902	74.8	1912	50.1
1893	72.3	1903	75.4	1913	46.5
1894	70.4	1904	75.3	1914	44 6
1895	67.8	1905	75.8	1915	45.5
1896	66.0	1906	73.4	1916	44.7
1897	62.4	1907	70.9	1917	43.3
1898	61.0	1908	63.2	1918	41.5
1899	66.4	1909	59.8	1919	40.6
1900	68.7	1910	55.9	1920	39.5
1901	71.4	1911	52.3	1921	38.3

The figures for 1922 are not yet available.

Lieut.-Colonel A. Murray asked how many of the 409 persons known to be suffering from small-pox in the four weeks ending June 30th were vaccinated at birth, and/or were vaccinated at a later period. Mr. Chamberlain stated that information was at present available in only 227 of the cases. This information was as follows, the particulars being subject to revision:

Unvaccinated	188
Vaccinated in infancy (including 2 suspected cases) ...	31
Vaccinated later—	
After infancy and before exposure to infection	1
After exposure to infection	3
Revaccinated	2
Stated to have been vaccinated but showing no cicatrix of vaccination	2

In answer to Mr. Bromfield, Mr. Chamberlain said that the organism of vaccinia had not yet been isolated. He was advised that the efficacy of the lymph issued from the Government lymph establishment was judged by the usual laboratory tests for purity and its effect as reported by public vaccinators. The Government lymph used during 1922 for 284,000 cases of primary vaccination gave a percentage success of 99.4.

In answer to Mr. Leech, Mr. Chamberlain supplied the following table showing in a series of years the increase in the percentage of exemptions from vaccination and the number of cases of small-pox.

Year.	Percentage of Exemptions.	Cases of Small-pox.	*Year.*	Percentage of Exemptions.	Cases of Small-pox.
1912 ...	32.1 ...	121	1917 ...	37.9 ...	7
1913 ...	35.2 ...	113	1918 ...	37.5 ...	63
1914 ...	36.5 ...	65	1919 ...	40.1 ...	311
1915 ...	35.8 ...	93	1920 ...	49.4 ...	280
1916 ...	38.0 ...	159	1921 ...	45.0 ...	336

Mr. Chamberlain stated on another question that the number of cases of small-pox notified this year up to June 30th was 1,225. A fatal case occurred at Gloucester on July 8th in an unvaccinated child. As was the case with other infectious diseases, errors in the initial diagnosis of small-pox had occurred in some instances, but the notification returns were corrected from time to time by the omission of those which had been found to be cases of chicken-pox and the addition of others originally diagnosed as chicken-pox but subsequently found to be cases of small-pox.

Ministry of Pensions.

A large number of questions with regard to matters arising in connexion with the work of the Ministry of Pensions were answered by the Minister last week. In reply he furnished information on the following points:

Steps have been taken to clear up doubts as to the exact effect of decisions by Assessment Appeal Tribunals. An explanatory note is to be included in the forms giving the decisions whereby these bodies set aside final awards. On June 30th the number of cases awaiting hearing by the various regional tribunals was: Scotland, 417; Northern, 289; North-Western, 1,007; Yorkshire, 551; Wales, 394; West Midland, 763: East Midland, 225; South-Western, 522; London, 1,716; Ulster, 356; and Ireland (South), 448. The number of appeals under Article 9 of the Royal Warrant received in six months ended June 30th was 16,969.

The Final Tribunals for assessment (which did not begin work until June, 1922) had decided 13,023 appeals up to the end of that year. Of these the assessment was increased in 2,500 cases and lowered in 22. The final award was set aside in 2,500 cases and the appeal disallowed in 8,000 cases. Cases of entitlement are referred to headquarters from the region only when they present special features of difficulty. In no case was entitlement cancelled on medical grounds whether in the region or at the headquarters of the Ministry except upon the advice of a medical board (usually with a specialist on it) which had seen and examined the man. Special Boards (not Re-survey Boards) are directed to satisfy themselves finally as to the correctness of entitlement. A review of entitlement might result in a change favourable to a man or the reverse. Thus in a recent fortnight's work there were 66 cases in which entitlement was changed to the advantage of the men from "aggravation" to "attributability" as compared with 45 in which the change was in the converse direction. In every such case the man had the right of appeal to the Independent Appeal Tribunal. During the two years ended June 30th, 1923, entitlement was corrected on the advice of medical advisers from "attributability" to "aggravation" in 18,000 cases, or 1 per cent. only of all the cases dealt with in recent years.

When it was certified by the medical officer of the Ministry that the nature of a treatment was such as to prevent the man from providing for his own support and the support of his family, treatment allowance would be paid.

In Scotland pensioners suffering from neurasthenia are treated at Edenhall and Craigleith. At both places there are facilities for occupational training. About 10 per cent. of the patients discharged were cured and about 60 per cent. materially improved. The total number of persons at present receiving treatment for war neurosis is about 6,900; the accommodation is ample and there is no waiting list.

Maternity and Child Welfare Services.—In a lengthy tabular statement furnished to Captain W. Benn, on July 12th, the Ministry of Health has analysed the expenditure on maternity and child welfare services. In 1921–22 the expenditure for medical supervision generally (including attendance at centres) was met by two equal contributions of £57,296 each from Parliamentary votes and from the rates. This compares with similar contributions of £38,047 from the two sources for the year 1920–21, and it also compares with two such contributions of £24,134 for the year 1919–20. The expenditure on milk and food for expectant and nursing mothers and children under 5 years of age was covered in 1921–22 by two equal contributions of £157,330 from Parliamentary votes and from the rates. These figures compare with £183,619 for the year 1920–21 and with £81,824 for the year 1919–20. The total net cost (met by Parliamentary votes and the rates) of the school medical service and the provision of meals for school children came out for the year 1922–23 at £1,279,562 for school medical services and £357,413 for meals.

Private Patients in Poor Law Asylums.—Mr. Hayday asked, on July 11th, by what authority the London County Council, through its asylum regulations, had interferred with the right guaranteed to a petitioner by Section 72 of the Lunacy Act, 1890, to direct the discharge or transfer of a private patient from a pauper asylum by exacting four weeks' payment if the patient was taken away, whereas in institutions for the rich the provisions of the Section were punctiliously carried out and the petitioner was allowed to leave at once on the legal directions given by his petitioners. Mr. Chamberlain said that inquiry was being made by the Board of Control.

Medical Aid Societies.—Mr. Clarry asked, on July 11th, if the Minister of Health would frame regulations whereby a friendly society or group of societies might form medical aid departments to supply medicine and surgical appliances to their members. Mr. Chamberlain said that the object desired could not be secured without amending legislation of a controversial character which he did not see his way to introduce.

Lead Poisoning.—On the Home Office vote, on July 12th, Mr. Godfrey Locker-Lampson (Under Secretary) explained the position as to the recommendations of the Geneva Conference to meet the risk of poisoning by the use of white lead in paint. The Conference, which met in 1922, agreed on a number of regulations to apply not later than January 1st, 1927; the matter was further investigated in 1923 in order that legislation should be introduced by various countries to carry into effect the agreement. It then appeared that a misunderstanding had arisen about one of the principal agreements under the Convention—namely, as to the proposed prohibition of the employment of women or young persons under 18. Apparently a good many of the members at Geneva thought that the article referred only to the painting of houses. Others declared that it referred to the whole of industrial painting. Until that point had been cleared up it was difficult for this country to agree to the ratification of the Convention. Recently, however, a new process involving the use of wet sandpaper had been invented by which the dangers arising from dry rubbing down could be prevented. Some people, however, said that if this sandpaper was used the dust was turned into a wet paint which clung to the hands and was dangerous. It was necessary that further experiment should be made with a new material before a decision was reached.

Intoxicating Liquor (Sale to Persons under 18) Bill.—This measure, introduced by Viscountess Astor, obtained its third reading in the House of Commons on July 13th by 257 votes to 10. It provides that intoxicating liquor shall not be sold for consumption to any person under the age of 18 subject to the qualification that beer, porter, cider, or perry may be sold to a person over the age of 16 for consumption at a meal on such portion of licensed premises as is set apart for the purpose. It should be added that the age is not absolutely a matter of birth certificate; the section lays down that a licence holder shall not "knowingly sell" to a person under 18.

Answers in Brief.

Owing to the reduction in the number of cases of infectious disease in London, further admissions to the Brook Fever Hospital at Shooters Hill are being stopped for the present, but the hospital will be reopened as soon as needed.

The Minister of Agriculture is considering whether it would be practicable to give effect to the recommendations of the Departmental Committee for a legal minimum standard of quality applicable to whole-milk cheese and cream.

The number of inquests held in the County of London in 1922 was 5,015. Of these 6 deaths were reported by coroners under the collective headings of "Deaths from disease aggravated by want, exposure, or self-neglect." Mr. Bridgeman added that deaths from exposure or self-neglect were not always due to destitution, and the returns do not show which, if any, of these 6 cases were attributable to destitution.

The number of deaths from tuberculosis in England and Wales during the year 1921 was 42,678; during the year 1922 it was 42,777.

Mr. Chamberlain is giving attention to the lack of clean and well-ventilated milk vans on certain railway lines, as reported by the Departmental Committee on the Distribution of Agricultural Produce, and is asking the Minister of Transport to bring the recommendation of the Committee under the notice of the railway companies.

Special provisions as to the precautions to be taken to prevent the spread of infection through the use of library books are contained in Section 59 of the Public Health Acts Amendment Act, 1907, and that Section may be put in force in any district on the application of the local authority. The Minister of Health does does not think it necessary at the present time to issue any special instructions to local authorities.

At the end of March 1,345,634, or 355 per 10,000 of the population of England and Wales, were in receipt of Poor Law relief. This is exclusive of special classes, such as lunatics in asylums.

Lord E. Percy informed Sir Walter de Frece, on July 16th, that it is within the powers of guardians, on the advice of the medical officer, to pay for the supply of insulin in cases of destitution.

England and Wales.

MENTAL HOSPITALS ASSOCIATION.

THE fifth annual meeting of the Mental Hospitals Association was held at the Guildhall, London, on July 12th, under the chairmanship of Alderman Francis Bate.

The chairman said that the chief matter of discussion was the Mental Treatment Bill, which included many of the proposals which the Association had actively pursued in the past. It was the view of the Executive Committee of the Association, which had addressed a communication to the Minister of Health on the subject, that the bill contained provisions which, if passed into law, could not fail to prove beneficial to those suffering from incipient mental illness, although the various clauses were not as far-reaching as had been desired.

Various suggestions on the clauses of the bill as put forward by the Executive Committee were then considered. The principal discussion centred around Clause 4, Subsection 4, which states that one of the medical practitioners making a recommendation for treatment shall be a person approved for the purpose either by the Board of Control or by the local authority. The Executive while realizing that a similar provision existed in the Mental Deficiency Act, 1913, was of opinion that in this case it was open to grave objection. In small areas it would impose on either the Board or the local authority the obligation of making invidious distinctions between local medical practitioners. No useful purpose would be served by the enactment, and it was highly probable that it would add to the expense and inconvenience which must necessarily attach to any application made on behalf of a person requiring temporary treatment. An amendment was moved by Alderman H. E. Witard (Norwich), seconded by Alderman D. J. Davis (West Ham), to the effect that the practitioner in question should be one who had expert knowledge in mental cases. It was urged that the stigma attaching to any who had spent even a short time in a mental institution was such as to make it imperative that the responsibility of sending anyone there should rest only on the expert. On the other hand, it was urged that there were not enough practitioners having expert knowledge available, although every medical practitioner had a general knowledge of the subject. The amendment received little support, and was negatived, and the Committee's recommendation objecting to the subsection was endorsed. Another suggestion which was agreed to by the meeting was that certain provisions with regard to after-care militated against the voluntary principle. It was considered that it was undesirable that after a patient had been discharged upon a trial he should be in any way associated with the institution.

The hope was also expressed by the meeting that the scope of the subsection dealing with out-patients might be amended, and the privileges enlarged. It was pointed out that if the definition of the word "institution" in the Lunacy Act, 1890, and in the Mental Deficiency Act, 1913, was to be applied to the bill, a visiting committee would not be able to contribute to the cost of an out-patient department for mental treatment in a general hospital. Moreover, where, as in many instances, he mental hospital was situated at a considerable distance from large centres of population, it might be desirable to institute an out-patient department away from the mental hospital. Other suggestions, introduced by the Committee and upheld by the meeting, concerned the question of expense of administration and maintenance. Another question which was brought forward was the responsibility of the Ministry of Pensions for the cost of ex-service men in mental hospitals. A matter which had arisen in this connexion in Newcastle, where it was alleged the Ministry had refused to accept the cost, was referred to the Executive Committee.

A long report was presented on the proceedings of the Joint Conciliation Committee which has been engaged on the work of improving and stabilizing the conditions of service of the nursing staff in mental hospitals. The report was adopted.

Alderman Bate was reappointed Chairman of the Association, and all the officers were re-elected.

NATIONAL COUNCIL FOR MENTAL HYGIENE.

A public meeting called by the National Council of Mental Hygiene was held at Caxton Hall, Westminster, on July 12th. Sir Courtauld Thomson, who was in the chair, said that this was the first meeting of the National Council of Mental Hygiene since it became a legally constituted body. Its main object was the preservation and improvement of the mental health of the nation. This vital question was being studied, and would be studied more in the future, by various schools of thought. The fact that every avenue leading up to the solution of this difficult problem was now being explored was not a sign of weakness, but rather showed that the movement was alive and virile. It would be the duty of the Council to co-operate with every association and public body which was honestly trying to throw light on this important question. Laymen like himself on the Council considered it a great honour to be associated with the medical profession in this work. There were many ways in which laymen could help: they could stimulate and support legislation, advise local authorities, assist in propaganda campaigns, and relieve their medical friends of some of the routine and organization work necessary to a movement of this kind.

Mr. Clifford Beers, founder of the National Committee for Mental Hygiene in the United States, then gave some account of what is now being done in this direction there. A beginning had been made in those preventive directions which were likely to yield the best results. About 90,000 dollars a year was given to the National Committee for Mental Hygiene to assist in preventing juvenile delinquency. The Committee had established three mobile clinics each of which was given to a particular city for a year in order to demonstrate what could be done with the "problem" child of the city, and as a result permanent clinics had now been set up at St. Louis, at Norfolk (Virginia), and at Dallas (Texas). An international congress was to be held in the United States in 1925, and he believed that within ten years the mental hygiene movement would be the outstanding health movement of America. He spoke at some length on suicide cases, two-thirds of which, he believed, might be prevented. The number of suicides in the United States was between 10,000 and 15,000 a year, and this toll of life would continue until mental clinics were in general operation.

Sir Maurice Craig said that until now very little had been done in mental cases before a complete breakdown occurred. Yet mental disorder was not a sudden event; it was of slow growth, and long before disintegration took place there were minor mental changes and emotional disturbances. The beginning of mental trouble was often an unhappy childhood. As for the child who developed criminal tendencies, he had asked an authority on the subject how early he could tell the criminal type in school, and the reply had been that this could be done very frequently at as early an age as six or seven. Asked further what was done in these cases, the reply of the authority was "next to nothing." The work of the Council, Sir Maurice Craig continued, was to collect knowledge, to survey the position, to instruct the public, and to join hands with similar bodies in other countries, for this movement was becoming international. It was most important that medical men and laymen should work together; they could not get behind the medical problem unless this were done.

Viscount Burnham said that one of his vivid recollections was of seeing in the City of Damascus thirty years ago people who were supposed to be suffering from mental affliction chained up against the bare wall of a brick enclosure. That was an oriental example of extreme barbarity, but in its principle and essence, apart from its more obvious cruelty, it was not so very far removed from the manner in which mental disorder used to be treated here and in nearly all countries.

A hearty vote of thanks was accorded to the Chairman and speakers on the proposition of Dr. Helen Boyle. The meeting was attended by a number of distinguished people, including the Spanish Ambassador.

Scotland.

WESTERN ASYLUMS' RESEARCH INSTITUTE.

THE thirteenth annual report of the Scottish Western Asylums' Research Institute for the year 1922, presented by Dr. William Whitelaw (Superintendent of the Institute), deals with several lines of investigation into the physical basis of mental disease that are being carried out. The Institute is situated at 10, Claythorn Road, Glasgow, and is supported by a group of asylums, district boards of control, and parish councils in the West of Scotland. As regards routine work 1,200 specimens, 340 samples of blood for the Wassermann reaction, and 110 specimens of cerebro-spinal fluid for this and other reactions have been examined. An important piece of work in 1922 was the investigation of two serious outbreaks of infectious intestinal disease among inmates of two of the associated asylums. These outbreaks were both found to belong to the enteric group of diseases, and each was due to a patient who was an unrecognized carrier. After the discovery of these carriers there were no further cases in either institution. The treatment of general paralysis of the insane during periods of remission in selected early cases, by methods which have been recently advocated, is being attempted. In another class of cases associated with infective conditions, autogenous vaccines have been tried in some instances, and in others an attempt has been made to change the organismal content of the bowel by giving milk soured with the *Bacillus acidophilus*. It has been found that these patients have improved in general health but that they have not shown any mental improvement. Another line of investigation has been made into the bodily changes accompanying strong emotional states such as fear and anger. It has been found that such cases show an increase of blood sugar. The report contains an appeal for material from cases dying with dementia praecox as the changes in the nervous system in this condition are under investigation.

EDINBURGH RECTORIAL ELECTION.

It is now officially announced that Lord Buckmaster has accepted the invitation of the Edinburgh University Students' Liberal Association to stand as Liberal candidate at the Rectorial election in October next. His opponents are the Right Hon. Stanley Baldwin, Prime Minister (Unionist), and the Hon. Bertrand W. A. Russell (Labour).

AMENITY OF EDINBURGH.

An important addition to the health-giving open spaces of Edinburgh has been made by the acquisition of Duddingston Loch, the large sheet of water which adjoins the King's Park and lies at the southern base of Arthur's Seat. The loch and its shores have been purchased for £3,500 by Mr. W. H. Askew, of Ladykirk, Berwickshire, and handed over to the Office of Works on behalf of the public; the arrangements have been carried out by *The Scotsman* newspaper. The donor of the loch, Mr. W. H. Askew, is a retired London stockbroker, and comes of an old Northumbrian family, the Askews of Pallinsburn. The family are descended from two well-known physicians, Dr. Adam Askew, called the Northumbrian Radcliffe, who practised in Newcastle and died in 1773; and his son Dr. Anthony Askew who was physician to St. Bartholomew's Hospital and Registrar of the Royal College of Physicians of London from 1767 until his death in 1774, leaving six sons and six daughters.

Ireland.

QUEEN'S UNIVERSITY OF BELFAST: GRADUATION CEREMONIES.

THE Graduation ceremony of Queen's University took place on July 10th in the Assembly Hall, Belfast, when the Marquis of Londonderry, K.G., Minister of Education in Northern Ireland, inaugurated his term of office as Chancellor, to which office he was recently elected by the Council, by presiding and conferring the degrees. In his opening address he referred to his predecessors, Lord Shaftesbury, who had been nominated in the Charter of the University in 1908, to Right Hon. Rev. Thos. Hamilton, the Vice-Chancellor and President of the College; to Dr. J. A. Lindsay, M.D., F.R.C.P.Lond., Professor of Medicine; and Mr. Thos. Sinclair, M.D., F.R.C.S.Eng., Professor of Surgery, all of whom were now retiring; and whose loss to the University was deeply and widely felt. They had all served the College and University in their several capacities with devotion and distinction. As regards the relation between the State and the University he took this the earliest opportunity of assuring his hearers that he held the view that the autonomy of the universities must be preserved; and that anything in the nature of State interference or control was very much to be deprecated. In the midst of a busy commercial centre such as Belfast the importance of an independent university could hardly be exaggerated. The value of research and the pursuit of learning for its own sake was emphasized. The Chancellor, the Speaker of the House of Commons of Northern Ireland (the Right Hon. Hugh O'Neill), and Sir Havelock Charles, Sergeant-Surgeon to H.M. The King, received honorary degrees of LL.D., which were conferred by Sir Samuel Dill, Pro-Chancellor. Some seventy-six candidates received the M.B. degree.

In the afternoon Sir William Whitla, M.P. for the University in the Imperial Parliament, and Lady Whitla gave a reception in the University grounds; some eight hundred guests accepted invitations to meet the Chancellor and honorary graduates. The weather was ideal, and everything was done to provide for their comfort and enjoyment. Some excellent music was given by the band of the Royal Ulster Constabulary, and the hosts gained the warm thanks and gratitude for their deightful and well-timed hospitality.

MEETING OF CORK MEDICAL PRACTITIONERS.

At a meeting of Cork medical practitioners the following resolutions were passed:

(1) That the committee of Cork medical profession protest against the Government introducing any medical legislation without consulting the elected representatives of the Irish medical profession.

(2) That we strongly support the Irish Medical Committee in any action they may take in this matter.

Correspondence.

INSULIN IN GENERAL PRACTICE.

SIR,—I do not think the medical profession realize as yet the full economic possibilities of insulin.

The consensus of expert opinion seems to be that its usefulness is confined to tiding patients over such crises as may arise, and that on account of its cost its continued use is only for the very rich or the very poor. That perhaps is true if one aims solely at the ideal of so correlating the dose of insulin with the diet that the blood sugar never rises at any time above 0.15.

As an experiment I determined to give my poorer diabetic patients an amount of insulin per day commensurate with their means. After working out their blood sugars I gave them the dose of insulin they could afford—varying from 5 units minimum to 20 units maximum per day. The smallest dose (5 units) was given before one meal; doses of from 15 to 20 units were given in equal portions before two meals. At the present reduced price of insulin these doses range from 10d. to 3s. 4d. a day.

The result of the experiment has been surprising. All patients have gained weight, have resumed work, or where they were working short time are now working full time. It was clearly brought out that a normal blood sugar is not necessary for an amelioration and ultimate disappearance of symptoms such as polyuria, thirst, lassitude, neuritis, etc.

Case A: Man aged 34. Symptoms—thirst, dry mouth, polyuria, and neuritis so severe that for the past seven years he has slept with his feet stuck out from under the bedclothes and has had a nightly dose of morphine. For the past two weeks he has had 10 units of insulin before breakfast and before the evening meal. At 8.25 a.m. before breakfast his blood sugar is 0.6, thirty minutes after breakfast it is 0.2, one hour after breakfast it is

0.34, by 5.30 p.m. it is 0.48. Yet all his symptoms have disappeared and he is full of the joy of life—no thirst, no polyuria, no neuritis.

This case is typical. What has struck me most is the quick acquisition of a sense of mental and physical well-being. Of course in all these cases I correlate the dose of insulin and the diet with the blood sugar findings as well as one can with the limited amount of insulin available.

In view of these results one can only conclude that insulin is a practical proposition, and that every diabetic patient who is handicapped in the struggle for existence by the complaint should be urged to spend what money he can afford on insulin, resting assured that it shall be returned to him a hundredfold in strength, happiness, and increased earning capacity.—I am, etc.,

Hornsea, E. Yorks, July 11th. ALEX. J. W. CALDER.

HISTORY OF MILITARY MEDICINE.

SIR,—In the BRITISH MEDICAL JOURNAL of March 10th (p. 419) General Sir W. G. Macpherson prints a long and courteous review of my *Notes on the History of Military Medicine*, in which, while pointing out several inexcusable blunders, he indulges in a little quibbling at my expense. At the end, where his chaffing culminates in "pyramidal pleasantry," my reviewer intimates that I do not even know the military significance of barrage fire or that daylight salvage of the wounded was possible before the barrage was invented. If one considers, however, the sad plight of wounded soldiers left for hours on the field in many great battles of the past (including some of the world war), I think it will be admitted that the barrage promoted efficiency in evacuation of the wounded, apart from its purely military aim.

My statements about the ultimate use of the evacuation hospitals and centres of *triage* referred, of course, to the American lines. In regard to the British casualty clearing stations, the parent of these devices, I stated on page 192 that they were invented in 1907—that is, five years after the conclusion of the South African war. That I date their origin in the period of the war itself seems an unwarranted inference.

My figures concerning Marlborough's march to Blenheim were not the result of mathematical calculation, but were taken on trust from Sir A. A. Gore's *Story of Our Service under the Crown* (1879). I regret that a book so interesting and informing should be misleading on this point. My figures of national battle losses in the world war are, for the most part, obviously rough estimates, but were the only thing of the kind available. They may be appraised in the light of Dr. Johnson's dictum: "Round numbers are always false." Those who expect too much from statistics of wars with heavy battle losses, particularly those in Eastern Europe from the earliest periods, may find consolation in the French proverb, *La plus jolie fille au monde ne peut donner que ce qu'elle a.* How such round numbers were ever evolved from the confusion and disorder following a pitched battle is one of those *problemas para solucionar* of which the Spanish-speaking physicians incessantly write. This is true of some of the statistics of the Napoleonic, Crimean, and Austro-Prussian wars. My failure to account for the work of the Austrian medical department in the pre-Napoleonic period is a serious error of omission, but that Brambilla and Sax are more important than Larrey and Letterman in the history of "collection, evacuation, and distribution of the wounded" will be news to American medical officers. I saw no mention of this view in the English, German, and French sources available (including Longmore). As for the assertion that the Brambilla-Sax sytem was subsequently adopted by the Continental and British armies, I am at this moment 10,000 miles away from any reference books, and beg that this momentous claim to perhaps the most important advance in modern military medicine be confirmed by textual verification.

The statement that my Notes were "largely culled from the writings of Frölich" will not, I think, be confirmed by anyone who is familiar with these writings or who has examined the pamphlet and its footnotes in relation thereto. Frölich's derivation of the Homeric *ἰητρός* from the concept "arrow" rather than from the verb "to heal," has, however, some justification, in that the Homeric "healer" was not a medicine-man but a wound-healer, as in the old High German epics in which surgery is *Heilkunst*. In this view, the verb *ἰάομαι* would connote wound-healing, and might have the same root-concept as *ἰός*.

In conclusion, I beg to say that my pamphlet was intended, not for the "instruction" of medical officers proper, but as a stimulus to further study among student officers at the Army Medical School, Washington, D.C., and that its title "*Notes*" conveys this fairly modest intention. I am glad to have perpetrated a few blunders in 206 pages, in view of their eventual correction by military authority so high.—I am, etc.,

F. H. GARRISON,
Manila, P.I., May 17th. Lieut.-Colonel, Medical Corps, U.S.A.

SIR,—You have kindly given me an opportunity of replying to Lieut.-Colonel Garrison's letter in which he criticizes my review, in the BRITISH MEDICAL JOURNAL of March 10th, 1923, on his *Notes on the History of Military Medicine*.

I will be as brief as possible. But first of all I must disclaim any attempt at quibbling or pleasantry in that review, and, moreover, I venture to think that no unbiased reader of it could discover any indication of such in it. I certainly fail to do so myself, and, in fact, nothing could be further from my wishes or intention than to indulge in any frivolity at the expense of so distinguished a colleague as Colonel Garrison, for whom I have the greatest respect and admiration, and from whom I have learnt so much. It was a reviewer's duty, however, to point out the errors which Colonel Garrison himself handsomely acknowledges to have occurred in his *Notes*, more especially as historical errors are apt to be perpetuated by repetition.

As regards barrage fire, I can state definitely, from personal observations during almost all the battles on the British Western Front, that wounded were cleared as rapidly before as after the introduction of barrage methods of attack; barrage, in fact, had absolutely no influence one way or the other on the work of clearing the wounded.

Colonel Garrison has entirely misread my remark about the casualty clearing stations. I did not say that he dated their origin to the South African war. What I did say was that he is wrong in implying their origin to the faulty organization of the field medical units during that war instead of to their faulty organization after the war—that is to say, to the faulty organization of the field ambulances during the reorganization of the bearer companies and field hospitals which existed at the time of the war.

He has cleared up the statement about Marlborough's march to Blenheim, but in doing so he offers us an extremely interesting example of how historical truth becomes perverted. He now tells us that the authority for his statement "Marlborough's celebrated march to the battle-field of Blenheim covering 1,176 miles in 86 days" was Sir A. A. Gore's *Story of Our Service under the Crown*. This book was a reprint from an article by Surgeon-Major A. A. Gore in *Colburn's United Service Magazine*, and this is the statement in it:

> "Marlborough's campaigns are also to be remembered for two marches of historical interest. His celebrated march commencing 19th May, 1704, and ending in the crowning victory of Blenheim on 13th August; and the march of the Prince of Hesse, rarely equalled for rapidity and execution. The first was commenced on the breaking up of winter quarters, the troops returning in the autumn during which they covered 1,176 miles (Millner)."

Now Gore bases his statement on Millner. Who, then, was Millner? He was a sergeant in the Royal Regiment of Foot of Ireland—in other words, the Royal Irish Regiment—who kept a journal and published it in 1733, and the following extract tells us of the origin of Gore's statement as modified in Colonel Garrison's notes:

> "The tedious but ever glorious, memorable and victorious campaign of 1704 was in length 30 weeks and one day; commenced the 24th day of April and ended on the 20th November; of which our Corps with the Grand Army, and apart, to, in and back from Germany march'd and sail'd ninety-one days and therein three hundred and ninety-two leagues or eleven hundred and seventy-six miles English."

This is a very different affair, and Marlborough's march to Blenheim, it will be seen, forms only a part of the 1,176 miles of marching and sailing of the Royal Irish Regiment in 1704. I confess that I was very much puzzled to account for Colonel Garrison's statement, but now that it has been cleared up my mathematical calculation to explain the puzzle has, of course, no longer any significance.

The influence of Brambilla and Sax will be found recorded in the voluminous works of Myrdacz and other Austrian writers.

"Sax was the moving spirit in all matters connected with the Medical Service in the War of Liberation. The Austrian organization for dealing with masses of wounded and evacuating them to fixed hospitals was indeed studied and imitated in the armies of Prussia and Russia, which formed the Allied Army against Napoleon."—(*Medical Services of Foreign Armies*, Part III, Austria-Hungary, 1910, p. 18.)

This, I take it, was the origin of the extension of the Austrian system to Continental armies; but, however that may be, I can only say that the British medical organization, which was first introduced into Field Service Regulations and the Manual of Training for the R.A.M.C. by myself, was learnt in the Austrian school, and I also know that my revered master, Sir Thomas Longmore, was influenced just as much as I was by its teaching and historical importance.

My conjecture that Colonel Garrison's *Notes* were largely culled from Frölich should be taken with the context, in which I fully recognized how deeply he had explored the literature of his subject in other directions. His derivation of the Homeric ἰητρός is, of course, debatable but not convincing.—I am, etc.,

London, S.W., July 12th. W. G. MACPHERSON.

ETHER *VERSUS* CHLOROFORM.

SIR,—To one who has been engaged in the administration of anaesthetics since the beginning of the century, this perennial controversy is a source of some wonder. One had thought the question settled long ago. But the old cry is revived that chloroform is quite safe if only the revivalist's technique is adopted; that deaths are not due to it, but to shock; that, from the operator's point of view, ether is an inefficient anaesthetic and equally dangerous owing to its remote effects.

Speaking generally, and I trust without offence, the experience of the advocates of these views is usually more peculiar than extensive. Dr. Samways speaks of hundreds of administrations to soldiers. Well, of these there were in the main two types—the shock-stricken or sepsis-ridden casualty near the front, and the healthy young man full of 'baccy and beer needing attention to a hammer-toe or tonsils at a remote base hospital. I venture to think that Dr. Samways's very satisfactory experience was not amongst the former. With the latter even an expert accustomed to getting every ounce out of ether will readily admit that in many cases the path of least resistance literally lies with chloroform. They required plenty of it, and it was indeed difficult to overdose them, and whatever anaesthetic was administered quick and good recoveries were the rule. In civil practice the vast majority of cases form a happy mean between these two extremes.

That chloroform is, on the table, more dangerous than ether has been proved by statistics; is, I believe, the considered view of all the most experienced anaesthetists; and is emphasized almost weekly in the press. Persuade yourself that many of these deaths are due to shock if you like, but you are still up against this—that chloroform is a depressant, promoting shock, ether a stimulant protecting from it. Moreover, should any contretemps arise during administration, if chloroform is the agent, grave, even if unnecessary, anxiety pervades the atmosphere; whereas if ether be the agent sublime confidence inspires all. Of three deaths I have seen before return of consciousness after administering ether, two were forlorn hopes before operation, and the third died of haemorrhage. All were kept alive by ether during severe and lengthy procedures and then slowly succumbed. Contrast this with two appallingly sudden catastrophes under chloroform—one during induction and one in quite an early stage of operation.

That as profound a degree of narcosis can be produced with semi-open ether has been proved by Rood,[1] and his "enclosed" method so ably advocated by Tilley I have found of the greatest possible value in such surgical procedures as demand it. In the vast majority of operations the light mixed narcosis produced by the minimum of open ether following *full* doses of alkaloids serves our purpose. When this method is carefully carried out after-vomiting is rare and bronchitis unknown, assuming, of course, infectious catarrhs are not epidemic and the patient has not been unduly exposed to chills. Finally, there is practically no risk of acidosis.—I am, etc.,

London, W., July 14th. G. A. H. BARTON.

SIR,—I should like to endorse all Mr. Tilley says in his admirable letter (June 30th, p. 1114), and it is strange indeed that chloroform is used when ether is so much safer.

It may be of interest to your readers to know that I looked up all the recorded deaths under anaesthetics in the United Kingdom in the *British Medical Journal* and the *Lancet* for three years—those preceding 1890—mentioning these in a letter to the *Lancet* (vol. ii, 1890, p. 44), there being 41 from chloroform and only 3 from ether, and 1 only from nitrous oxide.

I spoke very strongly in favour of ether in this letter, and from my own personal experience—it having been my duty to administer the anaesthetic for nearly ten years as resident medical officer in all major operations in three hospitals—I am happy to be able to state that I have had no death under any anaesthetic, either in hospital or private practice, before or since.

Ether has been chiefly my choice (or its mixtures) with Clover's inhaler, except in later years, when open ether has been used sometimes.

I have not seen any cases of "ether" bronchitis or pneumonia, and certainly no fatalities from this cause.

I will not repeat what I stated in the letter above quoted, except that ether always gives warning of its danger, whereas chloroform does not always, fatal cases occurring sometimes during induction—I am, etc.,

London, W.C., July 10th. H. C. NANCE, F.R.C.S.Eng.

TREATMENT OF FEVER.

SIR,—I have made trial in twenty-seven cases of influenza, eight typical cases of lobar pneumonia, and in several other acute infections, of the treatment recommended by Sir Archdall Reid for acute toxaemia (BRITISH MEDICAL JOURNAL, June 4th, 1921, p. 835), and I have obtained such excellent results that I would be glad to inform the medical profession of them. I will mention only three cases of lobar pneumonia which represent three different classes under different circumstances.

Case 1.—A priest, aged 57, had a severe chill on the afternoon of June 24th, 1921, followed by fever (39° C.); he passed a restless night and called me the following morning. I found him with a fever of 39.50° C., he complained of a stitch on the right side of his chest and had an incessant cough. Physical examination revealed the presence of all the symptoms of lobar pneumonia. I at once prescribed three powders, recommended by Sir Archdall Reid, and ordered him to take one at once and another in the evening. He was living in a village far from where I was, and on June 26th his son came and reported that his father had no fever, the cough was softer but contained traces of blood, otherwise he felt in perfect health and wanted to get up. He got up the next day. On June 28th he came himself to see me in excellent health, which he still enjoys.

Case 2.—A girl, aged 13, had a cold for about a week. On January 17th, 1922, she returned from the school with a fever of about 40° C. and cough and stitch on both sides; as they were not in a position to call a physician at once, they waited two days, when they noticed the bloody sputum, which caused them to send to me in the evening of January 19th. I found all the symptoms of double pneumonia, and after some hesitation ordered the same powders, with the result that on January 21st she had no fever and did not have any discomfort except the blood-stained sputum, which continued for over ten days after the fall of temperature.

Case 3.—A cabman, aged 35, robust and sanguine, had a history of two attacks of lobar pneumonia in the course of the last three years. In the first attack he was ill for over twenty-five days and

[1] *Transactions Royal Society of Medicine.*

in the second over forty days; it was a case of double pneumonia, the right side being affected first. When I saw him first on May 23rd, 1923, he had a fever of 39° C., a very severe stitch over the right side, and a dry cough: physical examination was positive as to lobar pneumonia. I again prescribed the same treatment. On May 26th I was called to see him, when I found him sitting up in bed with a smile; the fever had dropped the next day, cough was easier, but every now and then he spat pure blood, which continued for about a week, but later it stopped. He is at present as healthy as ever.

These and many other experiences cause me to believe that the above recommended treatment is more than worth while trying, especially so if started early enough.—I am, etc.,

Y. H. DJANIAN, B.A., M.D.,
Instructor in Parasitology and Materia Medica,
American University of Beirut (Syria).

July 4th.

SIR,—May I renew the appeal published in your issue of November 18th, 1922 (p. 1000), by Surgeon Commander R. J. G. Parnell, R.N., and others, that a trial shall be made of Sir Archdall Reid's formula (aspirin gr. x, pulv. ipecac. co. gr. v, and phenacetin gr. v) in the treatment of small-pox?

Like the signatories of that appeal, I have employed this particular combination of drugs in the treatment of many different fevers and inflammations, and in more than one personal illness. My experience has always been the same—natural sleep, sweating, quick relief from feelings of prostration, and, relatively speaking, a short and mild illness.

I am convinced that Reid's explanation is correct—that the toxins of disease are largely eliminated in the sweat; that the toxins tend to paralyse the sweat centre and so put the pathogenic organisms in a position of advantage; and that the drugs in this formula, acting together, tend to deparalyse the sweat centre. The amount of sweating caused by it is always proportionate to the height of the fever. If fever returns, as it may do again and again, each dose is followed by proportionate sweating. When there is no fever little or no sweating follows the dose. The heart and respiratory centres are quite unaffected.

I share fully the opinion expressed by Surgeon Commander Parnell and his co-signatories—

"Our hopes, we may almost say expectations, are that, if the treatment be employed early in the disease, vesication may be prevented; or, if not vesication, pustulation; or if not the prevention of pustulation, at least a mild attack may be secured" [in small-pox].

In this connexion may I point to the highly significant letter published in your issue of December 2nd, 1922 (p. 1097) by Captain Gelston Atkins, R.A.M.C.? As stated by Reid, the surest proof of the truth of a supposition is that it bestows the gift of prophecy.—I am, etc.,

W. BASTIAN,
Surgeon Commander, R.N.

July 7th.

THE EFFECT OF HEAT UPON OPERATIONS FOR EXOPHTHALMIC GOITRE.

SIR,—Mr. Walton's paper (June 23rd, p. 1045) shows in an interesting way the influence of mere physical conditions—for example, atmospheric temperature—upon operations which affect the thermal equilibrium of the body. The increased mortality in operations upon the thyroid gland in the summer months suggests the use of cooling treatment in the pre-operation period. May I record two observations on the effect of cold in Graves's disease which made a strong impression upon my mind?

1. A man in middle life, with acute exophthalmic goitre, recovered from all serious symptoms in three months spent in the north of Scotland, partly in a tent on the open moor, with persevering cold sponging. He died seventeen years afterwards of heart failure.

2. A woman of 50, similarly affected, and in an almost intolerable condition of heat, spent two hours daily in salt baths at 83° F. at Eastbourne, and proceeded afterwards to the Shetland Islands. After a second summer similarly spent, all her symptoms subsided, and she is now, twenty years later, in fair health.

No doubt many physicians could quote similar cases, showing the good effect of cool and breezy climates, with or without the temporary climate of cooling baths, in allaying excessive heat production in Graves's disease.

The risk of operations upon persons with deficient body warmth can, of course, be lessened by proper applications of heat. In the same way, the contrary condition, sometimes described as thermal debility or partial heat-stroke, is successfully treated by graduated and prolonged applications of cold. If the increased summer mortality of operation be due to heat, one might expect it to be prevented by a preliminary course of cooling treatment.—I am, etc.,

R. FORTESCUE FOX.

London, W., June 27th.

VACCINATION PROPAGANDA.

SIR,—A leading article in the JOURNAL of July 14th, under the heading "Vaccination Propaganda," discusses what has been done in this direction up to date, and states that the following steps have been taken: The issue of tracts, pamphlets, and leaflets by the Jenner Society, and one tract issued by the Ministry of Health to be obtained at the price of 3d. net, which, as you say, is not popularly known and probably very few outside the medical profession know of its existence. Compare this with the activities of the Anti-Vaccination League, and I don't see how one can be surprised at the low percentage of vaccination in proportion to births.

I maintain that the whole procedure of propaganda by leaflet, pamphlet, or tract is useless, especially if one has to go out of one's way and spend 3d. on it. The people who have to be educated by propaganda are the clerk, the working man, the small tradesman, and the like, who generally have no time or inclination to read unattractive tracts or pamphlets, and the only way, in my opinion, to drive home the importance of vaccination is to appeal to him through his sense of vision, and to do this at the time of his relaxation and in his home; and the best way to do this is the following:

A.

1. Have large illustrated posters depicting a man lying in bed suffering from confluent small-pox, the more ghastly-looking the better, with a footnote pointing the moral, such as: "What may happen to you if you do not get vaccinated."
2. Two faces of a beautiful woman—(*a*) vaccinated, without blemish; (*b*) not vaccinated, pitted all over and with a blind eye. ("Look on this picture, and on this.")
3. (*a*) Picture of a child blinded and pitted all over the body (non-vaccinated). (*b*) Picture of a child with a clear skin and perfect vision (vaccinated). ("Which would you rather your child should be like?")

B.

Have the various cinemas show films depicting the above or kindred pictures, but with more elaboration and explanation in the letterpress accompanying each, as here the people have more time to read about it, and end up the series with a brief film showing the process of the preparation of lymph, and expatiating on its harmlessness owing to the extreme care that is used to ensure its sterility.

The good work could be carried on in the home, as I am sure the great illustrated daily papers would reproduce the above, and the facts would be again impressed on the family and so help to drive one more nail into the coffin of the Anti-Vaccination League.—I am, etc.,

V. ST. JOHN CROLEY,
L.R.C.P. and S.Ed., D.T.M. and H.Lond.

Budleigh Salterton, July 16th.

SIR,—A fortnight since I was asked to judge at a baby competition among children up to 5 years of age. Vaccination was a point for which I gave a mark. Out of 222 children, only 54 had been vaccinated. The following excuses were given: Fathers objected to it being done on account of their having themselves had bad arms. The mothers in many cases had arranged with the officials for the vaccination, but had not turned up.

The outcome of this neglect will, I fear, be disastrous if an epidemic arose.—I am, etc.

M. CURSHAM CORNER, J.P.

London, E., July 12th.

FREEDOM OF NEGRO RACES FROM CANCER.

SIR,—One of the most lively impressions present to the mind of the medical worker in Nigeria after two or three years of routine work among the people is the apparent rarity of carcinoma. Personally, I have been looking out for it on the spot for some twenty-two years; and my

experience resembles that of my colleague, Dr. Dyer Sharp: I have never seen a case of carcinoma, or of sarcoma. Some of the medical men in the coastal regions of Nigeria encounter carcinoma occasionally; but chiefly among natives who have been in contact with the European, some of whose dietetic and other domestic practices they have copied—indulging, for example, in the consumption of tinned stuffs, and not impeccable tinned stuffs always; when they encounter it among indigenous natives from the interior it will generally be found that these are more or less exiles and almost inevitably denationalized to a greater or less degree.

It must, however, be remembered that the experience of the average observer is largely restricted to the inhabitants of European settlements — townships and Government stations; this means that many millions of natives inhabiting an area covering that of more than the British Islands thrice told (with a European medical personnel not exceeding that of a second-rate English provincial town) are not brought under anything which can be called systematic medical observation at all. On the face of it, one would naturally expect to find carcinoma commoner among natives outside of than among those within their proper habitat; but experience does not always conform to natural expectation; this points to the fact that cancer research, which does not include Nigeria (particularly Northern Nigeria), is far from being comprehensive.

Syphilis and many of the sequelae thereof are rife in Nigeria; and there must be few parts of the world in which the consumption of uncooked food and drink is more general. The wide dissemination of "idiopathic" abscesses sometimes impresses the observer with the feeling that molecular death may replace cellular anarchy among the indigenous natives of Northern Nigeria. But the pathology of Nigeria (like her natural resources) has only been scratched so far.—I am, etc.,

M. CAMERON BLAIR,
West African Medical Staff.

Edinburgh, July 16th.

Universities and Colleges.

UNIVERSITY OF OXFORD.

THE following awards have been made:

Radcliffe Scholarship in Pharmacology.—The Radcliffe Scholarship in Pharmacology has been awarded to R. B. Bourdillon, sometime Fellow of University College.

Theodore Williams Scholarships.—In Physiology: O. A. Beadle, New College. In Human Anatomy: J. S. Jerome, Christ Church. In Pathology: G. P. Wright, Exeter College.

UNIVERSITY OF CAMBRIDGE.

AT a congregation held on July 12th the following medical degrees were conferred:

M.D.—J. H. Pendered, F. S. Adams, R. French.
M.B., B.CH.—A. L. Crockford, W. Edwards, J. A. Struthers, H. L. Garson, D. J. Batterham, V. Wilkinson, A. P. Saint, L. E. H. Whitby.
M.B.—R. S. Corbett, W. R. Carling.
B.CH.—R. N. B. Wilson, E. B. Brooke, G. K. Cooper, J. Russell, J. M. Scott.

The following candidates have been approved at the examination indicated:

DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY.—Part I, *Physics and Electrotechnics:* H. O. Gunewardene, R. Hayes, H. K. G. Hodgson. Part II, *Radiology and Electrology:* N. M. Bodas, L. R. G. de Glanville, M. Frizell, H. O. Gunewardene, W. H. Hastings, B. Hayes, M. D. Joshi, Anna T. Kellock, G. J. Luyt, Margaret J. Moir, Jessie E. Sheret, S. B. Warden, E. V. Whitby.

UNIVERSITY OF LONDON.

UNIVERSITY COLLEGE.

THE following awards in the Faculty of Medical Sciences have been made at University College:

Buckhill Scholarship (1922): R. L. Midgley. Medical Entrance Exhibitions (1922): E. H. Madge and V. Freeman. Sharpey Scholarship: A. S. Parkes. Cluff Prize: G. F. H. McCormick. Schafer Prize: Dr. Katherine Coward. Gold Medal for Anatomy (Senior Class): G. F. H. McCormick. Silver Medal for Anatomy (Junior Class): H. Awrounin. Gold Medal for Physiology (Senior Class): G. F. H. McCormick. Silver Medal for Organic and Applied Chemistry (General Course): R. M. Sargent. Silver Medal for Pharmacology (General Course): Beatrice G. Smith.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL.

The following awards have been made:

Burney Yeo Scholarships: G. F. Taylor, M. E. Lamperd, J. W. Thornton, J. A. Eyres. Epsom College Scholarship: R. P. Ross. Senior Scholarship: W. P. H. Sheldon. Jelf Medal: F. Brockington. Tanner Prize for Obstetric Medicine: W. P. H. Sheldon. Todd Prize and Medal for Clinical Medicine: F. Brockington. Class Prizes: Diseases of Children, W. P. H. Sheldon; Orthopaedic Surgery, W. P. H. Sheldon; Medicine, R. Cove-Smith; Surgery, H. C. Edwards; Obstetric Medicine, F. Brockington; Pathology, C. E. Newman; Forensic Medicine, M. A. Paul; Hygiene, L. H. Savin; Psychological Medicine, M. A. Paul.

UNIVERSITY OF DURHAM.

AT the Convocation held on June 27th the following degrees were conferred:

M.D.—T. H. Bates, S. Worthington.
M.B., B.S.—W. O. Rubidge, J. C. Yeoman.

VICTORIA UNIVERSITY OF MANCHESTER.

THE following candidates have been approved at the examination indicated:

FINAL M.B., CH.B. (*Old Regulations*): Greta Lowe, L. Magenstern, L. Morris, G. T. Robinson, G. B. Stenhouse, G. Talbot. (*New Regulations*): A. Brown, W. E. Bacon, †‖A. Barlow, B. Bowman, ‖A. J. E. Cave, †§A Coleman, G. Crompton, N. L. Edwards, W. E. Fildes, W. A. J. Fleming, §E. J. Foulds, §Allen Glenn, †§‖Marjorie A. Grant, Evelyn M. Holmes, ‖K. H. Jackson, A. M. Jones, H. M. Levy, M. Parkes, D. Ramage, †§G. C. Sharp, Margaret Simcock, §W. Smith, ‖W. G. Southern, *‖L. J. Witts. *Obstetrics and Surgery:* W. Broadhurst, Madge E. Heywood, Bertha Kahn, ‡A. C. Kelly, W. B. McKelvie, Gladys F. A. McLean, Marjorie M. O'Dea, R. W. Parker, W. M. Roberts, Marjorie Robinson, Kate B. Scott, Agnes Seaston, Marjorie Thompson, Sarah Walker, Jane M. Wilde, Marjorie Youatt. *Obstetrics:* C. N. Aldred, V. F. Lambert, T. Pierson. *Forensic Medicine:* Bessie E. Cook, R. W. Fairbrother, T. Pierson. *Hygiene and Preventive Medicine:* C. N. Aldred, Bessie E. Cook, R. W. Fairbrother, T. Pierson, H. F. Shaw, R. Slater. *Surgery:* J. F. Bromley.

* First Class Honours. † Second Class Honours.
‡ Distinction in Obstetrics. § Distinction in Forensic Medicine.
‖ Distinction in Hygiene and Preventive Medicine.

UNIVERSITY OF LEEDS.

AT a congregation of the university held on July 13th the honorary degree of Doctor of Science was conferred upon Dr. W. J. Mayo of Rochester, Minnesota.

The Dean of the Faculty of Medicine, Professor J. K. Jamieson, in the course of the oration in which he presented Dr. Mayo, said:

"The remarkable institution called the Mayo Clinic in Rochester, U.S.A., emanates from the brains of the Mayo family, father and sons. Even were it permissible to describe it in a degree oration that could not be done in the Latin or English forms in use in our universities; it would require the happy amoebic pseudopodia of ancient Greek or the still developing collateral anastomoses of the American language to give a true idea of the development of the institution. It stands now as a monument of organizing ability founded on the sure rock of tireless work carried on with faith and enthusiasm. As there is nothing new under the sun one desires to seek its prototype in history. If there be a prototype it is in the Temple of Aesculapius at Kos. We do not know that this ever contained more than the spirit of a genius, and the Mayo Clinic fortunately possesses the body as well; but imagination allows us to draw a picture illustrating the resemblance. Were some catastrophe to dismember civilization it is quite possible that Rochester would become the second Kos. Therein we might find the buildings tenanted by priests clad in white vestments and masks performing a ritual reminiscent of the surgery of the early twentieth century, and receiving from the faithful tithes of the flocks and herds and corn and oil and—may we say—wine. The creation and development of an organism which is a fountain of progress in surgery flowing all over the world is surely good reason for our desire to honour its director; but here in this room we are not the whole congregation. We are surrounded by the faces of the unforgotten dead, who require of us that we accord no honour to success unless that success has been attained with due regard to certain ancient principles which are still the glory of the profession.

"I will therefore say that every new fact uncovered and every new idea conceived in Rochester has been freely and promptly communicated to the profession, and the whole surgical world have been free students of the Mayo Clinic; that the inheritance of an ancient obligation has been faithfully accepted and the afflicted poor have a generous share in the benefits of the institution; that success and praise have in no way misguided the workers in their quest for perfection. Emerson has said that if a man can do something, even the making of a mousetrap, better than anyone else, no matter where he hides himself, the world will make a beaten path to his door. Mayo has proved this true, but it is not only as the promoter of a colossal enterprise and as a distinguished figure in surgical research but as a true man, modest, charitable, and humane, that in the name of this congregation I present to you William Mayo for the degree of Doctor of Science."

The degree was conferred by the Vice-Chancellor, Sir Michael E. Sadler, K.C.S.I.

UNIVERSITY OF ABERDEEN.

AT the graduation ceremony on July 11th the following degrees were conferred:

M.D.—D. W. Berry, J. S. Anderson, A. Topping, Dorothy E. Bryant, A. C. Fowler, Louise Tomory.
M.B., CH.B.—*†A. W. Downie, *†R. D. Downie, †‡A. Lyall, †§A. G. Badenoch, ‡W. H. Harris, ‡Charlotte S. Hendry, †§I. W. Laing,

G. M. Anderson, Margaret J. Anderson, J. Burnett, Janet F. M. Burnett, C. W. M. Cameron, Catherine J. Clark, J. Clarke, P. G. Currid, R. Davidson, D. Dean, Elizabeth A. Dunbar, Mary Esslemont, R. C. Gordon, M. McK. Gunn, Eleanor M. Henderson, J. S. Hutchison, A. J. Ironside, E. J. Jolly, B. W. MacDonald, F. MacLean, ‡Florence J. Malcolm, J. C. Milne, H. W. Mulligan, R. G. Munro, F. R. Mutch, J. H. Peters, Margaret J. Rennet, E. R. Sorley, J. S. Taylor, Lily M. Watt, F. L. Webster, Mabel Wilson, Maude Wilson.

D.P.H.—Isobel C. Brown, Evelina I. Corbett, T. J. Davidson, G. L. Duncan, Ethel E. M. Gray, Elizabeth G. McCurrach, N. M. Maclennan, A. E. Reid, H. E. Smith, Christina Stuart, A. Topping, Alice M. Watt.

* First Class Honours.
† Passed Final Professional Examination with much distinction.
‡ Second Class Honours.
§ Passed Final Professional Examination with distinction.

UNIVERSITY OF SHEFFIELD.

THE University Council has appointed Mr. Denton Guest, M.B., Ch.B., to the post of Assistant Bacteriologist.

NATIONAL UNIVERSITY OF IRELAND.

AT the meeting of the Senate on July 6th Dr. Denis J. Coffey, Pro-Vice-Chancellor, was appointed as Representative of the University on the General Medical Council.

Dr. William M. Crofton, University Lecturer in Special Pathology in University College, Dublin, whose tenure of office was about to expire in accordance with the statutes, was reappointed.

The results of the recent summer examinations were considered and passes, honours, etc., were awarded in connexion therewith.

LONDON SCHOOL OF TROPICAL MEDICINE.

THE following were approved at the examination of the London School of Tropical Medicine, held at the termination of the seventy-second session (April to July, 1923):

E. Peterson (Duncan Medal), *A. B. Baldwin, *F. McCallum, *E. Pampana, *A. Salama, R. S. Aiyar, M. M. Khan, W. J. E. Phillips, J. L. Rebello, A. N. Kingsbury, F. R. Thornton, J. W. F. Albuquerque, N. S. Sethi, A. J. Keevil, D. J. Valentine, A. N. Thomas, L. S. Chatterji, K. K. Shenai, W. Simmons, H. Sheinbloom, M. R. Goverdhan, S. W. Hardikar, H. Morrison, G. Gollerkeri, K. S. Thakur, C. McIver, E. C. Cousins, G. W. S. de Saram, J. G. Dunlea, B. W. Dakers, J. R. Chandhri, A. M. MacRae, P. Couacaud, K. T. Thadani, J. B. S. Baxter, L. Ray, M. K. Gopala-Pillai, K. Singh, E. Sutcliffe.

*With distinction.

The Services.

DEATHS IN THE SERVICES.

Colonel John Girvin, Army Medical Staff (retired), died in a nursing home on June 25th, aged 61. He was born at Seaforth, Lancashire, and received his medical education at St. Bartholomew's Hospital. He entered the army as surgeon on July 27th, 1887, and attained the rank of lieut.-colonel on February 9th, 1912, and became colonel in the great war promotion of March 1st, 1915. He served in the Sudan campaign of 1898, receiving the medal and the Khedive's medal; and in the recent war served as D.D.M.S. in Gallipoli and Egypt. Sir Robert Armstrong-Jones in the course of an appreciation writes: He came of a well-endowed Scottish family and the racial character of tenacity, caution and commonsense were innate to his nature. Although himself an Anglican, it was probably his paternal Presbyterian sympathies that caused him to regard ceremony with suspicion and to believe that truth and reality dwelt rather in the informal and the simple. He was born in 1861 and was one of a large family of successful brothers and sisters. It may be truly said of him that his mentality had no angles, and apart from the bent of his mind the upbringing he experienced caused him to be tolerant, receptive, and sympathetic. After an apprenticeship at Dorking—an unusual occurrence even in the eighties—he entered St. Bartholomew's Hospital as a student in 1882, where he developed a friendship with Sir D'Arcy Power, Sir William J. Collins and the writer, which lasted a lifetime. Shortly after his first term of service in India he was ordered to Egypt, where he remained for three years during the Egyptian war; after the war he served in Cyprus, where he received the special thanks of the Governor for his voluntary work for the civilians and peasants. Later, he was appointed to the medical charge of the Guards in Wellington Barracks, and for over two years was secretary to Sir A. T. Slogett. He was afterwards sent specially to Sierra Leone on the West Coast of Africa, and later to India, a second time, as senior medical officer at Hyderabad, Scinde. He returned home in 1913 and later helped to form a new hospital for Gallipoli, being there appointed, first, as chief in charge of the advanced base hospital, and secondly, as D.D.M.S. After Gallipoli he again served in Egypt, where has was in charge of the 27th General Hospital. Whilst in India he married Miss L. Smith, whose mother was well known in Poona for her public services. Their only child, a son, educated at Haileybury, was a most promising young officer in the 7th Royal Dublin Fusiliers; he died from wounds received in Salonika—a blow from which Colonel Girvin never recovered, his health gradually failing from that date.

Obituary.

ETTIE SAYER, M.B., B.S.LOND.

PROLONGED ill health, the warnings of which were persistently ignored by one always eager to forget herself, resulted, on July 7th, in the death of Dr. Ettie Sayer in her 48th year. Many societies and institutions, and even more individuals, will mourn the loss of a woman who was always generous with her help and advice—generous, unfortunately, to a degree amounting to self-neglect.

Ettie Sayer was born at Bacton, Norfolk, and received her medical education in London, studying during the early part of the course at University College, and completing it at the Royal Free and Queen Charlotte's Hospitals. She graduated M.B., B.S.Lond., in 1899. Her first house appointment was at the Tunbridge Wells Eye and Ear Hospital. In 1900 she went to South Africa as physician of the Cowley Mission to Mohammedan and Kaffir Women, and was later appointed Plague Officer by the Cape Government. During the South African war she worked in the concentration camps, and was also one of the few who visited the lepers on Robben Island.

On her return to England Dr. Sayer was appointed Assistant Medical Officer to the Education Department of the London County Council. She was one of the first women to do such work in the days before full-time officers for medical inspection of school children were appointed. There are so many men and women doing this work, which is now so efficiently organized, that it is not easy to visualize the difficulties which beset a pioneer. Always enthusiastic and zealous, Dr. Sayer accomplished her difficult task with the utmost conscientiousness, and by her personal charm endeared herself to her superior officers and subordinates alike. Dr. Sayer was particularly interested in feeble-minded and morally defective children. She was consulting physician to the National Society for the Welfare of the Feeble Minded, and wrote papers on morally defective school children. She was a Fellow of the Royal Society of Medicine and Honorary Medical Officer to the Society for Distressed Gentlefolk.

Recently Dr. Sayer interested herself in electro-therapeutics and was a Fellow of the American Electro-Therapeutical Society. She wrote papers on the effects of electric currents on blood pressure and compiled a most useful textbook for nurses on medical electricity and light.

GEORGE JOHN MURIEL, M.R.C.S.ENG., J.P.,

Consulting Surgeon, Whitehaven and West Cumberland Infirmary.

WE regret to record the death, in his 81st year, of Dr. George John Muriel, J.P., of Whitehaven. He was born in Ely on September 4th, 1842, and was the youngest son of the late John Muriel, F.R.C.S., D.L., J.P., of that city. The Muriels have practised in Ely and the Eastern Counties for several generations. George John Muriel was educated at Epsom College (being one of the earliest pupils there) and at Guy's Hospital. After acting as assistant at Whitehaven from 1866 to 1868 he began to practise on his own account at Alrewas in Staffordshire. On the death, however, of his former principal at Whitehaven he returned to that place, where he resided for the rest of his life. He was appointed to the honorary staff of the Whitehaven and West Cumberland Infirmary in 1872 and became consulting surgeon in 1900 when he retired from general practice, being succeeded by his second son. He was President of the Border Counties Branch of the British Medical Association in 1898 and the first Chairman of the West Cumberland Division under the new constitution of the Association. To celebrate his long connexion of fifty years with the Whitehaven Infirmary he was presented with his portrait two years ago. The large attendance at the funeral, despite the fact that he had retired from practice so long ago, showed the respect with which he was regarded by all classes in the town and district, and by his medical colleagues, all of whom were present. His wife died two years ago; he his survived by all his family (four sons and three daughters) except one son who died in 1878.

Dr. WALTER LEY PETHYBRIDGE, of Plymouth, who died on June 27th, aged 54, was born at Bodmin and received his medical education at St. Bartholomew's Hospital. He graduated M.B.Lond., with honours in obstetrics, in 1892, and M.D. in the following year; he also took the diplomas of M.R.C.S. and L.R.C.P. in 1892. He went to Plymouth in 1895, and was for nearly twenty years pathologist to the South Devon and Cornwall Hospital; he was also consulting pathologist to the Ear and Throat Hospital, Plymouth, and to the Tavistock and Bodmin Hospitals, and held the appointment of anaesthetist to the Royal Eye Infirmary, Plymouth. He was one of the first in this country to employ Pasteur's method of inoculation against rabies, and during the outbreak of rabies some years ago he undertook the treatment of cases from all parts of the country, at the request of the Local Government Board. During the war Dr. Pethybridge held the rank of Captain R.A.M.C., T.F., and was Director of Pathology for the South-Western Military District. In 1920 he was elected president of the Plymouth Medical Society.

THE death occurred at Taunton on June 27th of Dr. EDWARD LIDDON, in his 93rd year. He was educated at King's College, London, Edinburgh University, and Paris; he took the diplomas of M.R.C.S.Eng. in 1852 and L.S.A. in 1853, and graduated M.D.Edin. with gold medal for thesis, in 1854. At the time of his death he was consulting physician to the Taunton and Somerset Hospital, of which institution he was also an ex-president and the oldest life governor. As a young man Dr. Liddon was house-surgeon to the Bath United Hospital and resident assistant to the Brompton Hospital. He served for many years with the 2nd Volunteer Battalion Somerset Light Infantry, retiring with the rank of Surgeon Lieut.-Colonel. A keen sportsman all his life, he was at one time master of the Taunton Vale Harriers, and hunted with them until he was over 80. Dr. Liddon was a zealous churchman—his brother was the late Canon Liddon—and a generous supporter of every philanthropic organization in his district. He was twice married, and leaves a widow and two sons, one of whom is vicar of Minehead.

Medical News.

THE Duke of Connaught, President of the Royal Society of Arts, last week presented the Albert Medals of the Society, awarded to Sir David Bruce and Sir Ronald Ross "in recognition of the eminent services they have rendered to the economic development of the world by their achievements in biological research and the study of tropical diseases."

A MEETING of the London Association of the Medical Women's Federation was held on July 10th at the South London Hospital for Women. After tea in the grounds of the hospital, those who were unfamiliar with its buildings were taken on a tour of inspection by Miss Maud M. Chadburn, the senior surgeon, who played a prominent part in the foundation of the hospital in 1912 and in the planning of the building of the in-patient department on its present site in 1916. Notable features are the provision of accommodation in small rooms and cubicles for private patients at fees varying from 3 to 6 guineas a week and the wide balconies attached to nearly every ward. A visit was paid by certain members to the theatre, where Miss Eleanor Davies-Colley was operating, and in other departments of the hospital cases and specimens were shown. A business meeting of the association in the hospital board room concluded the proceedings.

DURING the International Exhibition of Hygiene a puerperal fever congress will be held at Strasbourg from August 1st to 4th under the presidency of Professor Bar of Paris. The following papers will be read: (1) Historical sketch of puerperal fever and the importance of Pasteur's discovery, by Dr. Couvelaire of Paris; (2) bacteriology and morbid anatomy of puerperal fever, by Dr. Brouha of Liége; (3) diagnosis and prophylaxis of puerperal fever, by Dr. Hauch of Copenhagen; (4) treatment of puerperal fever, by Dr. Alfieri of Pavia. The subscription is 40 francs, which includes admission to all parts of the Exhibition of Hygiene. Further information can be obtained from the general secretary, Professor Schickelé, Clinique d'Accouchements, Strasbourg.

THE series of post-graduate lectures at Queen Charlotte's Lying-in Hospital, Marylebone, came to an end on July 19th. A new series will begin in October.

THE foundation stone of the new casualty department of the Royal Northern Hospital, Holloway, was laid by Lady Patricia Ramsay on July 12th. The building is being erected by the Borough of Islington War Memorial to commemorate the supreme sacrifice of those who fell in the great war and the brave deeds of those who survived. The sum raised was about £12,000, and £2,900 more is required to complete the memorial.

THE annual report for 1922–23 of the Professional Classes Aid Council (on which the British Medical Association is represented by Dr. G. E. Haslip) shows that the work of the council in assisting in relieving distress among the professional and educated classes and their dependants has been steadily consolidated during the past twelve months. During the year there were 538 new applicants (of whom 149 were refused as being unsatisfactory or not within the scope of the council), and 89 former applicants reapplied (of whom 32 were refused for similar reasons). Fifty families received educational assistance during the year. The question of providing funds is still serious; the expenditure for the year amounted to £7,334, the balance sheet showing a deficit of £2,213.

PROFESSOR LUBARSCH has been appointed director of the Robert Koch Foundation for Combating Tuberculosis in place of the late Professor Orth.

VISCOUNT BURNHAM has accepted the office of Vice-President of the Royal Sanitary Institute, which was founded in 1876, and has for over thirty years maintained a museum of sanitary apparatus. The Institute will hold its thirty-fourth congress and health exhibition at Hull, beginning on July 30th. The Right Hon. T. R. Ferens, High Steward of Hull, will preside, and nearly 500 delegates have been appointed from this country, including those nominated by the Admiralty, the Board of Control, the Office of Works, the War Office, the Ministry of Health, and the Scottish Board of Health. Representatives have also been nominated by foreign and dominion governments, and municipalities, including Bombay, South Australia, New South Wales, Victoria, Brisbane, Perth, New Zealand, Christchurch, Cape Town, Kimberley, South Africa, Czecho-Slovakia, Greece, Mexico, United States of America. Sir Alexander Houston, K.B.E., M.B., will give a lecture on a pure water supply to the congress on Tuesday, July 31st, and on Thursday, August 2nd, Mr. B. Seebohm Rowntree will give a popular lecture on industry and national welfare. There will be four sections: sanitary science, of which Sir William Hamer, M.D., is president; maternity and child welfare, including school hygiene, presided over by Dr. J. R. Kaye; engineering and architecture; and domestic hygiene. There will be seven conferences; one of medical officers of health will have Dr. T. Eustace Hill as chairman, and another on health visitors will be presided over by Professor H. R. Kenwood.

IN reporting on two years' working of the United States Prohibition Act, the Federal Prohibition Commissioner makes special reference to the Treasury decision, first suggested by the American Medical Association, which limits withdrawals of whisky for medicinal use to spirit which has been bottled in bond. In 1920 the total whisky withdrawals amounted to 12,389,529 gallons; in 1921, to 3,243,845 gallons; and in 1922, to 1,819,888 gallons.

DURING the year 1922, 9,935 cases of small-pox occurred in Canada and the United States, of which 495, or 5 per cent., were fatal. In 1921 the mortality was only 1 per cent. In some towns the case mortality during 1922 ranged from 16 to 85 per cent.

A FRENCHMAN accused the English of taking their pleasures seriously. If under "pleasures" games are to be included the accusation had little truth in it until this present generation, which under the pressure of American excellences is studying and playing games with astonishing seriousness. We are informed that this seriousness is now to be extended to mountain climbing. A ten-day course of scientific instruction, theoretical and practical, in mountaineering is, we are told, to be given at the end of July at Klosters, in the Grisons district, Switzerland, at a fee, including board, of 6 guineas. The course is to include first aid in accidents. Full particulars may be had from Gustav Walty, Klosters.

THE house and library of the Royal Society of Medicine, 1, Wimpole Street, W.1, will be closed for cleaning and repairs during the whole of August.

X RAYS, LIMITED (11, Torrington Place, Gower Street, London W.C.1) has issued an album of illustrations of the apparatus it makes. It contains a photograph of a group, including Dr. Coolidge, but this and another portrait hardly justify the title, *Who's Who in X Rays*. The company informs us that in future if the end connexion is required for the Coolidge tube an extra charge of 15s. will be made, making the total £40 15s.

THE KING has granted a Royal Charter of Incorporation to the Royal Westminster Ophthalmic Hospital.

DR. S. GORDON LUKER will give a lecture in the anatomical theatre of the London Hospital Medical College on Tuesday, July 24th, at 4.15 p.m., on a new method of treatment of puerperal sepsis. The lecture is intended for senior students of the hospital and post-graduates, to whom a cordial invitation is given.

THE 19th South African Medical Congress will be held next year in Grahamstown, Cape Province, when the hosts will be the medical practitioners in Grahamstown, Port Elizabeth and Uitenhage. The president of the congress will be Dr. E. G. Dru Drury, of Grahamstown.

THE Lord Mayor of London (Alderman Edward C. Moore) has consented to act as the honorary treasurer of the Endowment Fund of the People's League of Health. Cheques should be sent to him at the Mansion House.

THE Military Hospital, Rochester Row, Westminster, has been closed and the work transferred to the Royal Herbert Hospital, Woolwich.

THE well known physiologist, Professor J. P. Langlois, of Paris, has recently died at the age of 61.

THE United States Public Health Service has declared the port of New Orleans to have been completely free from any trace of bubonic plague for the past two years, and will now entirely withdraw its staff; a test of 200,000 rats caught in that period revealed no trace of infection. Precautionary work in rat eradication and tests will in future be undertaken by the city board of health.

DR. GELLÉ, a well-known French pioneer in otology, and one of the founders of the Societé Française d'Oto-rhino-laryngologie, has recently died at the age of 80.

Letters, Notes, and Answers.

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London;* telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London;* telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Mediocra, Westrand, London;* telephone, 2630, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin;* telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh;* telephone, 4361. Central).

QUERIES AND ANSWERS.

"J. D." asks for advice in the treatment of an old lady who suffers from intense burning of the feet at night, so severe as to prevent sleep. Many remedies—mostly external—have been tried in vain. She has a cardiac lesion, and the loss of sleep is a serious factor.

LETTERS, NOTES, ETC.

DEVICES FOR INVALID COMFORT.

SIR CHARLES BROWN, M.D., of Preston, who is nearly 87 years of age and has been all but confined to his dining-room (where he sleeps) for the past eighteen months, has devised a combination of two chairs with simple accessories, which invalids should find useful. The chief item in the combination is an American rocking chair, which can be fixed at different levels by a wedge; with it may be employed a companion chair which, with a flat cushion made to fit its seat and a hot-water bottle, makes a comfortable bed for the heels; a pulling-up cord controls the position of the hot-water bottle. The bedclothes are fixed to the back of the companion chair and are arranged somewhat in the form of a tube or sleeping bag. A simple table for meals completes the outfit.

TEETH AND SUGAR.

MR. C. N. PEACOCK, L.D.S. (Bedford), writes to suggest that practically all decay of children's teeth is to be laid to the charge of "so-called sugary foods": he inquires what daily amount of sugar should be included in a well-balanced diet for a child. Our correspondent points out that raw flour, tragacanth, and glucose which sticks to the teeth, are used in the manufacture of sweets. The child who eats them coats his teeth with an ideal paste for the production of dental caries. The suggestion is that the Sale of Food and Drugs Acts might be amended, but we are inclined to think that education of the parents both on this point and on the amount of sugar a child needs in its daily diet (it may be none is needed) would be more effective. It is a matter that might well be discussed at congresses of child welfare.

THE CAUSATION OF CANCER.

DR. A. S. DUTTON (London) writes: The circumstance that friction by the clothes of a chimney-sweep, when of a rough corduroy type or of other materials, during their employment most of each day doubtless considerably enhances the irritating effect of soot, and that the irritation by the latter is more or less constant, appears to account largely for cancer of the scrotum in man, and afford reasons for its non-production by the rubbing in of soot in rabbits, rats, and mice, as referred to in Dr. A. Leitch's article in the BRITISH MEDICAL JOURNAL of July 7th (p. 1). Apart from the effect of clothes, a reason for the scrotum being the site of cancer in sweeps and not other parts of the body may be that the scrotal rugae afford an especially favourable site for the lodgement of soot, which—although washing takes place, unless this is effected to the extent of full immersion in water and also the vigorous use of soap—tends to accumulate to a certain extent among them in some cases without being at any time wholly removed, and therefore forming a practically constant source of irritation. The wearing of suitable overalls which prevent soot reaching the scrotum would apparently prevent the occurrence of sweeps' cancer. Similarly, if tar, pitch, and paraffin were prevented from reaching the scrotum of workers in these industries by suitable protective material, cancer of this structure occasioned by them should be eliminated.

BREEDING RATS FOR FEEDING EXPERIMENTS.

IN order to maintain a collection of rats suitable for dietary experiments considerable wisdom has to be shown in the selection of the stock and precautions taken against parasites and bacterial infections. Professor V. H. Mottrams and his co-workers have described in a recent article (the *Biochemical Journal*, vol. xvii, No. 2, 1923) the method they adopt: this report will be of value to those engaged in similar work, and certain of their conclusions are of general biological interest. They have found that the best stock is obtained by intensive inbreeding from one or more pairs of adult animals which have been obtained from a good source when quite young and kept on a good diet under strict observation. There is no evidence that there is any danger in inbreeding when the original stock is good—in fact, it is of advantage in stabilizing the stock and limiting variations. The mixed stock from dealers is often infected with disease which may not betray itself early in life and is almost impossible to eradicate. Probably most of the failure in rat breeding is due to housing; in order to avoid such diseases as pneumonia the animals should be housed at a temperature of 65° F., with no more than 5° variation in either direction. There is no justification for the widespread belief that rats will not thrive in metal cages; they are easier to clean and they have been used by these workers for rearing generation after generation from birth to adult life. The stock should be fed on diets containing bread and milk and kitchen scraps with a high percentage of protein and fat, and the mothers should receive during lactation liberal supplies of bread and milk.

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NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 27, 30, 31, and 33 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 28 and 29.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page *37*.

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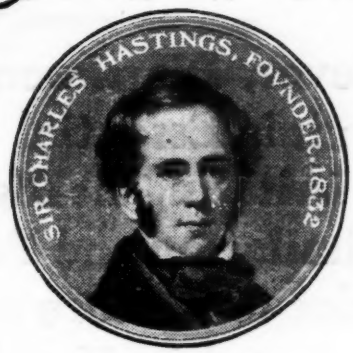

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British Medical Association.

NINETY-FIRST ANNUAL MEETING, PORTSMOUTH, 1923.

President's Address
ON

ENVIRONMENT AND HEALTH.

BY

CHARLES P. CHILDE., B.A., F.R.C.S., M.R.C.P.E.,

SENIOR SURGEON, ROYAL PORTSMOUTH HOSPITAL.

LADIES AND GENTLEMEN,—My most pleasing task to-night is that embodied in the first words I have to say to you. They are to extend to you, as President of this Association, the warmest possible welcome to Portsmouth. Although I do this first in the name of the Portsmouth Division, which has invited you to hold your meeting here, and is consequently your official host, yet I wish at once to assure you that this welcome is equally shared by the general body of medical practitioners in the neighbourhood, by the Corporation, by the naval, military, and air forces, by the business community, by the press, and by all classes of the inhabitants. All have contributed without stint in their endeavour to make this meeting one agreeable to you, as well as worthy of the hospitality and prestige of Portsmouth; and I feel, and I am sure the Division would feel, that I had been guilty of an omission if I did not freely and generously acknowledge this at the very outset. This whole-hearted joining of hands for a common purpose is evidence of a loyal and healthy citizenship, of which Portsmouth has furnished abundant examples in the past, both in the grim circumstance of war as well as in many historical functions of peace.

We shall have amongst us during the present week men and women belonging to the profession of medicine from all over the globe; from all parts of the British Isles; from our overseas Dominions; from the great continent of America. These are our own flesh and blood; all members of the Anglo-Saxon community of peoples. Need I say they are all equally welcome? And need I say that equally welcome with these are our distinguished foreign visitors? Indeed the word "foreign" is somewhat out of place at our meetings; for there are no foreigners in the profession of medicine. Medicine knows no frontiers. It is a working illustration of the international as opposed to the national conception of society. We have in being a Medical League of Nations. As far as the policies of medicine are concerned, as far as its problems are concerned, as far as its aims and ideals are concerned, there is only one race, and that the Human race; only one nation, the nation of Men and Women. All its discoveries, all its developments, all its weapons, both offensive and defensive, are common property, to be used by all, for the benefit of all. It has no crafty policies, no patents, no jealously guarded secrets, no selfish practices, at the disposal of one nation to the detriment of another, or of one class to the detriment of another. Its enemies, disease and death, are foes common to all mankind. If the nations of the world devoted their energies and opportunities internationally in the same sense that medicine does—to fighting the universal foes of mankind that confront us at every street corner; to remedying the many hardships and handicaps that are quite as painful and crippling as disease; instead of to the periodic pursuit of mutual self-destruction, styled by the strangest of paradoxes "civilized warfare," we should be a happier as well as a healthier world to-day; and incidentally we should not have to congratulate ourselves on a public debt of £8,000,000,000 and an income tax of 4s. 6d. in the £.

Portsmouth has been singularly fortunate in the honour you have bestowed upon it in visiting it twice within a quarter of a century. Considering that it does not possess a university and is not a centre of medical education—a handicap of no small extent in a gathering of this character—it is a great compliment that, having met here so recently as in 1899, the Association has repeated its visit this year.

It will recall two honoured memories if I mention that the late Dr. Ward Cousins was your President in 1899, and the late Alderman Sir Scott Foster our Mayor. The former was for years a member of the Council of the Association, a very regular attendant at these meetings, and he was one of the staunchest and most active supporters of the British Medical Association throughout a long life; that the latter was one of the most distinguished and respected public men that Portsmouth has known. It is peculiarly fitting that his younger brother, equally distinguished and equally respected in his public life, should occupy the mayoral chair to-day on the occasion of your second visit.

Inasmuch as the Printing and Publishing Committee has compiled a *Book of Portsmouth*, which will be presented to every member on registration, I do not propose to say anything of the history of Portsmouth, though it would have furnished engrossing material for an address, and I was sorely tempted to avail myself of the opportunity. But on consideration it seemed hardly fair to ask the Committee to go to the trouble of getting out a *Book of Portsmouth*, and then to anticipate the result of their labours by my remarks to-night. I have therefore chosen quite another subject. But before embarking on it, I should like to touch in the briefest way upon two or three current local topics. It was not till 1920—that is, three years ago—that Portsmouth, for the first time in its history, forsook its island home in Portsea, and crept out on to the mainland, embracing the village of Cosham immediately to the north, and to the west some 500 acres of the southern slope of Portsdown Hill. This extension, there is not the slightest doubt, will be in the future—indeed it has already begun to be—an invaluable asset to the town; for here is one of the most salubrious building sites in the kingdom, and within easy distance of the island of Portsea. It is

here, when the country becomes alive, as it eventually must become alive, to the social and hygienic necessity as well as to the economic advantage of clearing the foul slum areas that disgrace the life of our great industrial centres, and breed and perpetuate an underworld, both moral and physical, whose end-results we annually spend millions of the taxpayers' and ratepayers' money in attempting to alleviate—it is here that the wage-earning classes of Portsmouth should find a sure escape from the poisonous, sunless, and depressing conditions in the slums of Portsea.

Next one word about the most famous of all our ships—H.M.S. *Victory*. She was not built at Portsmouth, though she had been the town's most treasured possession ever since she returned here, more than a century ago, with the dead body of a nation's hero. For over one hundred years she floated at the mouth of the harbour, the sentinel of England's greatest naval port, and the token of perhaps her most glorious days. Quite recently, as you are aware, owing to the ravages of time she has had to be removed to the dockyard, where no doubt many of you will be visiting her during the week. It is a national, no less than a local, satisfaction to know that owing to the energetic effort of Admiral Sir Doveton Sturdee and the ready response to his appeal, she will be restored to a condition worthy to fly the flag of the Commander-in-Chief of the first naval port of the Empire.

Portsmouth's past is writ large in the annals of our history. It is a town whose walls and stones, if they broke silence, could almost tell the story of the great empire over which the Union Jack flies. It is less easy to forecast its future. It has leant in the past on the British Navy, and the British Navy has leant no less upon it. All its interests have been sacrificed to the needs of the nation. It is not denied that this has had compensating advantages for the town. It would seem, however, if its energies are no longer to be required for national purposes, to be only fair that every consideration and every facility should be given it by the Government during the transition period which must elapse before it can make good in other directions and stand firmly upon its feet again. With these few remarks regarding local topics, I pass on to the subject of my address.

ENVIRONMENT AND HEALTH.

During the past fifty years medicine has done infinitely more to constitute itself a science than in all the previous ages. This has been mainly due to the flood of light thrown upon the specific etiology of many diseases by the epoch-making discoveries of Pasteur, and the stimulus those discoveries have given to other workers. Previous to this almost nothing was known of the agencies concerned in the onset of any diseases, except those of purely mechanical origin. Of such widespread and prevalent disorders as the surgical infections, enteric fever, tuberculosis, diphtheria, syphilis, malarial fever, pneumonia, and many others, the causes were entirely unknown, the speculations and theories as to their origins were various—"Quot homines, tot sententiae"—and their treatment was entirely empirical. All disease was a mystery. A great deal of it is no longer a mystery. Approximately one-half of the diseases with which we are acquainted are now known to have their origin in infection by living organisms belonging either to the plant or to the animal kingdom, and the probability is that the list is not yet nearly exhausted. Besides this it has been computed that nearly half the deaths that occur annually are traceable to the same cause.

With the emergence of medicine from the mysterious, no less a revolution has occurred in the practitioner of medicine. While a good bedside manner is still a valuable asset and will so remain in so far as it connotes a sympathetic and human attitude towards the sick and suffering, and while from a business point of view a good shop front no doubt has its value, no longer are the doctor's brains assessed by the sheen of his tall hat or the length of his frock-coat. Like medicine, the doctor has become less mysterious, less aloof from and superior to his fellow men. Knowing more he has become less omniscient. Standing on surer ground he has become less pretentious. The medical priestcraft, reminiscent of a time when the medicine man was more priest than physician and more charlatan than either, has disappeared or is disappearing. This is all to the good, and tends to a more enlightened confidence between doctor and patient.

Again, so much relating to the discoveries and advances in medicine nowadays finds its way into the lay press that the general public has, apart from its technical aspects, a broad knowledge of the progress medicine is making, and is alive to its new developments. This is again to the good. A strong opposition is always an incentive to good government. The advent of a wide-awake and informed public tends to keep the profession up to the mark. It adds nothing to the dignity, not to mention the security, of the doctor to be questioned by his patient on some new treatment or phase of a disease he has never heard of, but with which he finds his patient has more than a bowing acquaintance.

It was a natural sequence of the elucidation of the causative agent in many of the infectious diseases that scientific effort should be directed to two main objectives: first, to the discovery of means of producing an artificial immunity similar to the active natural immunity which it was a matter of common knowledge resulted after recovery from an attack of many of them; secondly, to producing immunity reactions which should have the effect of neutralizing the toxic products of the invading organisms during an attack. In both of these directions remarkable results have been achieved, both by what is known as vaccine prophylaxis and therapy, and antiserum prophylaxis and therapy.

The most completely successful example of *vaccine prophylaxis* is that of vaccination against small-pox, introduced by Jenner in 1798. This remarkable discovery was the result of shrewd observation and logical deduction. It was nevertheless empirical; the principle on which it rested was not understood until the work of Pasteur more than half a century later. In countries where vaccination is twice practised, small-pox has practically ceased to exist, and its sporadic outbreak from time to time is a warning to the public of neglect of the means to prevent it. In typhoid and paratyphoid fever, by measures along the same lines, immunity lasting for a period of one or two years can be secured, and has greatly reduced the incidence of these diseases both among civilians and soldiers.

Again, the mortality from rabies has been reduced from 16 per cent. to a fraction of 1 per cent., an active immunity being capable of being produced here after infection has already taken place, owing to the lengthy incubation period of the disease. *Vaccine therapy*—that is, the production of active immunity after attack by a known micro-organism—so ably advocated by our own countryman Sir Almroth Wright, has given very beneficial results in staphylococcus infections, skin affections, etc. Of *antiserum prophylaxis* the best example is that obtained in tetanus. The mortality following Fourth of July injuries in America has ceased to exist owing to its use, and no less life-saving results were obtained by the same means in the great war. The most familiar and the most successful instance of *antiserum therapy* is that of diphtheria, which has reduced the mortality from 40 to 10 per cent., and, if used on the first day of the disease, to almost *nil*.

These are veritable triumphs of strictly scientific medicine. In other diseases more or less success has been achieved. But closer investigation has shown that there are many factors requiring elucidation which undoubtedly influence the result—such as choice of route, recognition of different types of the same disease, etc.—and it will certainly take many years of patient endeavour before the ultimate possible results in securing immunity are obtained. In many instances prophylaxis or cure has eluded us, and the results have proved disappointing. The above may be termed the result of scientific effort, either preventive or curative, directed towards the individual.

There are other diseases, which have been attacked from a totally different angle—namely, by studying and combat-

ing conditions which favour the growth, dissemination, and virulence of the infecting organism, by so altering environment and increasing natural resistance, whatever that may precisely mean, that many diseases which have been very prevalent and very fatal in the past have almost or entirely ceased to exist, and are no longer of any account. Let me give you one or two very familiar examples.

Take typhus fever. During the last century it prevailed in all the large cities of Great Britain and the Continent. So late as 1875 in England and Wales there were 1,499 deaths from the disease. During recent years the name "typhus" has seldom appeared in the Registrar-General's returns. It is a disease essentially dependent on filth and overcrowding. Bad as these conditions are even now in our large industrial centres, the disappearance of this disease is evidence of an improvement as compared with half a century ago—an improvement in environment and an improvement in natural resistance, owing to better living conditions, sufficient to have caused its disappearance altogether. After the peace of 1815, following a long and exhausting war, when the economic position was somewhat similar to that existing at the present time, typhus fever and relapsing fever, which occurs under similar conditions to typhus, were rife in England and Ireland. No such catastrophe has accompanied the economic depression following the last great war.

Take, again, typhoid fever. It is a water-borne disease. Bad drainage and a contaminated water supply are the factors favouring its distribution. Its prevalence or the reverse in a community is the measure of their sanitary intelligence and enterprise. Filth, overcrowding, and bad ventilation are factors conducing to its prevalence, by lowering natural resistance. The marked decline in typhoid fever is again the result of an improvement in environment. Typhoid fever has declined from 375 per million in 1870 to 25 per million at the present time. In Portsmouth typhoid fever, quite prevalent in the town when I came here thirty years ago, has almost ceased to exist.

These are examples of diseases which have disappeared, or are disappearing, owing to action following an intelligent study and comprehension of the conditions and environment favouring their distribution.

Now, "environment" is obviously a very wide term. It embraces living conditions generally. The amount and quality of food and water, the presence or absence of domestic hygiene, the supply or not of good drainage, the furnishing or not of healthy conditions in factory and workshop, the prevalence or not of smoke and fog, the provision or not of adequate open spaces, playgrounds, and recreation grounds, access or not to sound education—these and many others are all factors in environment. And it is satisfactory to note that these matters are receiving from governments and local authorities some of the attention which all of them deserve. But I propose to-night to consider for a few moments the special environmental factors governing the slum areas of our great industrial centres—the lack of fresh air and sunlight, and the cramped and penalizing conditions to health, both moral and physical, owing to overcrowding; and to inquire what bearing these factors have upon four out of five of the most formidable endemic scourges which afflict all northern civilized peoples to-day.

The five scourges I allude to are Cancer, Tuberculosis, Rickets, Venereal Disease, and Alcoholism. Tuberculosis and rickets account for most of the cripples we see about us; cancer, tuberculosis, venereal disease, and alcoholism account for most of the deaths; venereal disease and alcoholism account for most of the misery and moral degradation of our race.

We may dismiss cancer at once from the count. The humiliating confession must be made that we know very little about it. That it has some relation to civilized environment seems evident from the fact that it is a comparatively rare disease among primitive races, and that it is certainly making rapid headway among all civilized peoples. But of the nature of the environment favouring its activities we are in complete ignorance. It is neither foul air nor fresh air, neither hardship nor indulgence, neither poverty nor riches. Cancer like death—

> "Aequo pulsat pede pauperum tabernas,
> Regumque turres."

The only things we know about it which are worth knowing are its age incidence, its relation to chronic irritation, and the fact that it is in its beginnings a local disease, and that therefore it can be cured by early removal in those situations where removal is possible.

This is practically all we know about cancer. I wish to make only two comments. The first is that this knowledge is not enough. In an age which has yielded the secrets of so many diseases it is a point of honour with the medical profession not to rest content till this pressing problem has been solved. With the public it is not only an obligation but, from the point of view of their own interest and safety, a vital necessity to furnish the financial means of solution, and to see to it that research is not crippled or stinted by any niggardly parsimony.

The second comment I make is this: The most important fact we know about the disease is that in its beginnings it is local, and that its course is a centrifugal spread from its local point of origin. Is that knowledge anything like as productive as it might be? Undoubtedly it is not. Notwithstanding the fact that cancer has been cured over and over again by modern operation—a fact which in itself proves that it is curable—yet I believe patients come no earlier to the doctor with it than they did thirty years ago, though time is the very condition of the only cure we possess for it. Many medical men, and I confess I am one of them, are of opinion that there is considerable room for improvement in this direction. Without resort to any sensationalism some obvious steps could be taken to spread the knowledge of a few very simple facts about cancer. This would give a by no means unwarranted ray of hope to the public and would enable some of the victims of this terrible disease to apply in time to have, at all events, a chance of cure or freedom from recurrence, whichever you like to call it. This by the way.

I pass on to the consideration of the other four scourges—tuberculosis, rickets, venereal disease, and alcoholism.

Tuberculosis first. We know the cause; it is the tubercle bacillus. We know also the prime and essential conditions of its cure; they are fresh air and sunlight. These are not only the essential conditions of its cure, but are almost the sole conditions. Those of you who are interested in the subject will have an opportunity of visiting the establishments at Alton and Hayling Island, under the able administration of Sir Henry Gauvain, where the cures are fresh air and sunlight. Dr. Rollier of Leysin read a most instructive paper at the Glasgow meeting last year, and quoted many instances of cures, and lasting cures, by these agencies in all regions of the body. It is foreign to my purpose to discuss to-night the method or supposed method of their action, or the method of their application. If, then, these agencies, fresh air and sunlight, are, as we know they are, so powerfully antagonistic to tuberculosis—whether by directly controlling the activities and virulence of the tubercle bacillus itself or by fortifying the natural resistance and so enabling the human organism to establish an immunity to it (it matters not, the result is the same)—are we not justified in the converse conclusion, that the breeding ground of this disease, the environment most encouraging to its activities, are the sunless, airless, overcrowded, and insanitary slum areas of our great cities, where houses are built forty or more to the acre, and stand back to back, and side to side, like any jig-saw puzzle, so that fresh air and sunlight, the proved destructive agents of the tubercle bacillus, can never enter? Is it a sound economic proposition to equip and maintain, at the cost of millions of the taxpayers' money, sanatoriums for the so-called cure of tuberculosis, while we guard intact the very preserves of this disease by the exclusion of fresh air and sunlight, which cost nothing, and maintain in our midst a soil which can breed more tuberculosis in a week than all our sanatoriums can cure in a year? Dr. Rollier says:

> "Housing has played an immense part in the genesis of child and adult tuberculosis: the community bears the responsibility of the waste of human lives through insanitary houses."

The industrialization of Sweden since 1870 has been accompanied by a high adolescent mortality due to pulmonary tuberculosis. Sandberg, commenting on this, says:

"The cause of this difference between earlier and more recent times seems to us to be in the fact that formerly the adolescent boy and girl remained at home for a longer time—nowadays one goes more frequently and at an earlier age to the city or factory. The new conditions of existence bring, in many cases, increased dangers to health and life, dangers which, especially in the case of women, often lead to tuberculosis."

In 1885 the tuberculous gland cases admitted to the Alexandra Hospital for Sick Children, Brighton, constituted 6.5 per cent. of all admissions. In 1899 they were 3.5 per cent.—a reduction of nearly 50 per cent. Between 1885 and 1899 Brighton has swept away most of its insanitary areas. Numbers of similar instances could be quoted. It is no unwarrantable assumption that by permitting—and that is all we have to do—the sun and fresh air into our slum areas we should see a very marked general decline in the incidence of tuberculosis.

Consider next Rickets. Its etiology is unknown. There are two opposing theories as to its origin—the dietetic and the hygienic. There are those who positively assert that it is a deficiency disease; that it is due mainly to lack of fat-soluble A. There are others who as stoutly deny that diet has anything to do with it. We may leave the theorists to settle their differences and turn our attention to certain facts about it which have long been established, and certain other facts which have recently come to light. It never occurs among races living under natural conditions, and is especially prevalent among the poor in Europe and America living under so-called civilized industrial conditions—in other words, the thoroughly bad hygienic conditions of overcrowding and absence of fresh air and sunlight. Among the well-to-do it is practically unknown. In India, on the other hand, as recently shown by Hutchinson, it is a disease of the rich. It does not occur among the poor labouring class who live an open-air life, but is prevalent among the rich Mohammedans and Hindus, who are confined in airless and sunless rooms. Hutchinson discovered also this remarkable fact—that late rickets was restricted to females, who alone are confined, according to the purdah system of isolation as practised by the wealthy natives of India. Again, eminent observers in Glasgow, who have quite an exceptional acquaintance with rickets—it being, as you know, very prevalent in that city—have always associated the disease with overcrowding and lack of hygienic conditions and sunshine, which you also know are conspicuous features of that great hive of industry. According to Miss Fergusson, 50 per cent. of the children in the poor quarters of Glasgow are rickety—a vastly smaller proportion in garden cities, such as Bournville. The prevalence of rickets, she says, is associated with close confinement in tenements. Most important of all, we have the recent experiments of the Lister Institute in Vienna. They prove conclusively that a deficient diet can only produce rickets in the absence of sunlight. If abundant sunlight be present a deficient diet is powerless to give rise to it. Lastly, we have the significant fact that the sun's rays without any other treatment whatever can cure it—an explanation of the oft-repeated dictum that anybody can cure rickets in the summer.

All this does not prove that the absence of fresh air and sunlight is the cause of rickets; but it does prove this—that in overcrowding, confinement, want of fresh air and sunlight, we have an environment conducive to the development of rickets, either by the supply of conditions favourable to the activities of the virus, whether microbic or otherwise, or by lowering natural resistance to it. Conversely, that fresh air and sunlight and good hygienic conditions furnish an environment which is powerfully antagonistic to the disease; that they have either the power of damping down the activities of the virus whatever it is, or that they can so alter the metabolism of the body as to provide an increased resistance and immunity to it. Whichever is the method, the result is the same. These facts appear to indicate clearly and unmistakably the way to the control of this crippling and dangerous disease. And, as Mellanby says, its eradication would do away with a great deal of the bone deformity, improve the physique, lower the infantile mortality, and, most important of all, improve the teeth of the people of this country beyond recognition.

Let me invite your attention in the next place to Venereal Diseases, which have figured so largely in the public eye during recent years, are discussed in every drawing-room, exhibited at every picture house, and with regard to the most suitable methods of controlling which there are acute differences of opinion, both among medical men and the lay public. They are the diseases of immorality. The contributing environmental factor here is the indiscriminate admixture of the sexes of all ages, a necessity of their living conditions. It is not, of course, contended that by an improvement in housing immorality would be stamped out, but it is contended that the conditions of overcrowding, without regard to age or sex, which exist in our industrial centres make the practice of morality well-nigh impossible.

Let me put before you a few facts; they are taken from the report of Dr. Chalmers, the medical officer of health for Glasgow, for 1921. There is no intention to single out that city as a sink of iniquity, or an example of a condition of things peculiarly revolting to the conscience of civilized humanity, and I have very little doubt its case could be paralleled in our own borough of Portsmouth; but I have the facts for Glasgow, and I have not similar facts for Portsmouth. In Glasgow, out of a population exceeding a million, over 600,000 live in one-roomed or two-roomed tenements. Under the heading "Sex overcrowding in small houses," Dr. Chalmers gives the following appalling examples:

"In a one-roomed house a father of 52 occupied the same bed with a mentally defective daughter of 24, who had an illegitimate child of 10. In another, with space for five adults, a father and daughter shared the same bed. In another a mother shared the same bed with two sons of 19 and 20 years respectively. In two-roomed houses, in one instance, a son of 19 and a daughter of 21 occupied the same bed; and in another a son of 19 and a daughter of 25, who was pregnant."

However revolting these facts may be, it is right that the public should be made aware of them. This, then, being an example of the state of affairs in our industrial centres, it may be confidently stated that a great deal, at all events, of immorality and its consequences, venereal disease, is the direct result of environment—that the conditions existing make either the teaching or practice of morality impossible, and furnish the breeding ground for venereal disease.

Have we not, it may be asked, missed one phase of the problem, and are we not somewhat out of touch with the situation, with our societies for the prevention of venereal disease and for combating venereal disease quarrelling amongst themselves as to the best means of meeting the evil, and local authorities and the lay public equally divided, when conditions such as I have depicted are rampant in our midst? It is this aspect of the problem—the immorality and its consequence, venereal disease, which are the direct result of overcrowding without regard to age or sex—which I wish to lay particular stress upon here.

Consider, lastly, the abuse of alcohol. There is no doubt that, without anything in the nature of prohibition in this country (and I believe it to be foreign to the instincts of our people to have their lives, what they may eat, and what they may drink, regulated by the policeman), there has taken place during the past fifty years a steady move in the direction of greater sobriety among all classes of the community. Among the upper and middle classes drunkenness was the fashion less than a century ago. It is now a disgrace. In the army, navy, and mercantile marine there was, fifty years ago, infinitely more drinking than there is to-day. In the streets of our towns the drunken man of any class is not nearly such a familiar sight as he was a generation ago. This must be attributed broadly to social evolution, to general civilizing influences—better education and the inculcation of greater self-respect, which such influences promote. There are, of course, many factors at work here; but in the forefront of civilizing influences is the improvement of the home. So long as the public-house is more comfortable and more attractive than a man's home, the former will claim his leisure hours. Give him a comfortable and respectable home, and the lure of the public-house will automatically diminish. In the debate on Lady Astor's bill, a few months

ago, a good deal was said about the improvement of the public-house; but nobody suggested that, by devoting greater attention to the home, we might go a long way to improving the public-house out of existence altogether. Drunkenness stands in much the same relation to bad housing conditions as immorality and venereal disease, and, moreover, is admittedly a potent factor in the dissemination of the later.

In the foregoing remarks I have endeavoured to emphasize the relation of the special environmental factors of the slum areas—lack of fresh air and sunlight, and overcrowding—to four out of five of the great endemic scourges afflicting the community at the present time. I have said nothing of their relation to epidemic diseases, though there is no doubt that some of the latter are powerfully influenced by the same factors. For instance, pneumococcus lung infection is certainly a disease mainly of cities and crowded places, the infection spreading from pre-existing cases or healthy carriers. Observations in South Africa showed that natives who had recently arrived at the mines and occupied crowded compounds were most susceptible; and Gorgas, in a report upon pneumonia in the Rand mines, draws attention to the fact that there was the same high incidence among labourers in the Panama Canal zone, until they were removed from crowded compounds and encouraged to live in separate huts. The high mortality attending measles is probably attributable to similar conditions. Epidemic disease is, however, more elusive and less under control, and for that reason I have omitted it from argument.

If, then, I have submitted evidence that, by a determined attack upon our slum areas, there would be a reasonable expectation of making a beginning of the end of four out of five of our most formidable endemic diseases, the question is, Would it be worth while? Not as a sociological venture, or on humanitarian grounds, or as a moral obligation, on any of which there would be little difference of opinion; but "would it be worth while" as a business proposition? Because, however satisfying it may be to our consciences to prate of social and moral duties to our fellow men, when it comes to doing anything, and especially to spending taxpayers' and ratepayers' money, it is usually the business and economic aspect of any question which mostly counts. It is, therefore, from this point of view only that I approach it, and I omit all moral considerations. Besides, moral values cannot be assessed in pounds, shillings, and pence, though nobody would deny that they represent a very real asset.

In a paper read at the meeting in Glasgow last year, entitled "The economics of public health," Lieut.-Colonel Fremantle, consulting medical officer of health for the County of Herts, by a series of calculations, estimates the total direct material loss in England and Wales from sickness and disability at a minimum of £150,000,000 a year. From tubercle alone the estimated loss is £94,000,000 a year. In the United States of America, with a population three times as great as England and Wales, the estimated cost of sickness and death is £600,000,000 a year, of which at least one-third is considered preventable. Taking the cost to this country of sickness and disablement at £150,000,000 per annum, the country could spend without loss £50,000,000 annually, or, capitalized at 5 per cent., £1,000,000,000 on clearing the slum areas and securing better housing and living accommodation, provided that the cost of sickness and disablement were thereby reduced by one-third.

What actual sum would go to the credit side of the nation's health bill it is obviously impossible to determine. It would admittedly, therefore, be a speculation. But it would not be a bogus venture. An assured dividend of considerable amount is in sight. The improved physique of the nation; its better health; the diminution certainly, the extinction possibly, of such diseases as tuberculosis and rickets; the improved moral tone of the people, and the resultant diminution of venereal disease and its consequences; decrease in the consumption of alcohol with its disastrous effects on infantile and adult mortality, with the misery and moral degradation it brings to the home, with the loss of time, increase of industrial accidents and industrial inefficiency it entails—these and other items are the prospective dividend. Whether it would or not strike £50,000,000 off the annual health bill is the speculation. In this connexion I would remind the overcautions and those averse to any kind of speculation or any degree of risk, that it is the speculators who have made this great empire—the men of courage and enterprise, men who have faced the uncertain and the unknown, and have not been afraid to take risks. And if we have not been afraid to speculate in adventure, in arms, in trade, and in business, why should we be afraid to speculate in health?

To face the risk would require a bold and imaginative statesmanship. It does not belong to the business outlook of the parish pump, only prepared to estimate in pounds, shillings, and pence the return on the capital expenditure. It would almost certainly eventually result in a real economy to the State. What we are doing now is to provide the breeding ground for the mass production of disease with one hand, and with the other paying out millions of the taxpayers' and ratepayers' money to deal with the end-results of the very diseases we are fostering in our midst. It has been frequently said, the people make the slums. Such a pessimistic assumption would sound the death-knell of all progress. But it is nothing more than the comfortable argument of the man selfishly indifferent to the obligations of citizenship and regardless of his duty to the body politic. It is flatly contradicted by the fact that through all the ages man, like every other living thing, has been the product, not the cause, of his environment. The slums make the people you find in them, and the only astonishing fact is that they can breed any other sort. It is a testimony to their physique and spirit and grit, no less than to the universal natural law of the survival of the fittest, that some of the inhabitants of the slums win through such an environment and escape the moral and physical ruin which engulfs those of weaker fibre.

The industrial revolution which occurred in the last century accounted for the urbanization of our population, and the herding together of millions of workers in our industrial centres. This has been going on ever since. The early hour at which work commenced, the long working day, entire absence of rapid transport, or rather of any transport at all, necessitated their centralization in the heart of our great towns, where land has consequently become of greater value than health. These conditions are reversed to-day. Powerful centrifugal forces have come into play, and have come to stay. The working day as a rule begins later, the hours are shorter, the day for half the year is longer owing to the Daylight Saving Act, and the means of rapid transport are available, and are becoming increasingly available every year. It has become, therefore, practicable in many instances for the worker to live further from his work—in other words, to move from the centre towards the periphery of our large towns, where land is cheaper and where it becomes, therefore, a business proposition to build on town-planning lines, and avoid the past errors of herding human beings together like sheep in a pen or pigs in a sty.

In this connexion it would seem that the first and most essential requirement in future building is to reduce the density of the houses—in other words, the number to the acre; and it is disappointing, and in the opinion of many a grave defect in the Government's last Housing Bill, that no such restriction appears. In submitting town-planning schemes, however, local authorities have, under the Housing Acts, powers to regulate for this, and a memorandum from the Ministry of Health suggests twelve, ten, or eight houses to the gross acre as suitable density requirements according to the nature of the neighbourhood. If this in the opinion of the Ministry is the correct requirement for health, what are we to say about houses built forty or more to the acre? The only answer is that they should be swept away wholesale at the earliest possible opportunity.

The air space and sun space round the house is of infinitely more importance than the size of the house itself, or whether it contains a parlour or not. The cramped crofter's cottage does not produce rickets and tuberculosis, because his children live mostly in the sun and air round their dwelling; but children "cabin'd, cribb'd, confin'd"

in the dark sunless and airless environment of our large towns are inviting both all the time. The most important educational requirement of domestic hygiene and its highest fulfilment is the open window, night and day, summer and winter. It is astonishing how quickly the human organism abjures the hothouse conditions of civilized living and adapts itself to its natural environment, fresh air. The tuberculous patient, after three months' open-air treatment in a sanatorium, cannot endure the closed window in his own home. The tuberculous children at Leysin in Switzerland, and at Alton and Hayling Island in this country, live practically naked in the open air, and by that habit and that habit alone throw off a most formidable and deadly disease. Why, then, all the care of healthy children, with their active metabolism capable of adapting itself to almost any requirement, to wrap them up in the warmest of clothing, confine them in hot rooms with windows shut, keep every draught from their bodies, and submit them to general hothouse conditions suitable only to the old whose metabolism is barely sufficient to keep body and soul together, and whose clock has almost run down?

Modern civilization is suffocating itself in the polluted atmosphere and darkness of our great industrial cities. The need of pure air and sunlight, of which there is plenty about, and to be had for nothing, was never so insistent as it is to-day. These great gifts of nature were plentifully supplied to primitive man, and were his only sure defence against disease. They are as bountifully given to civilized man, but he seems to have lost sight of their value, or to have deliberately turned his back on them, while he requires a whole volume for the mere nomenclature of his innumerable diseases.

Perhaps apology is needed for touching to-night on a problem which may be considered rather a sociological one than one of strictly scientific medicine. But apart from the fact that I believe a wide latitude is permitted in the Presidential Address to this Association, my choice of subject can, I think, be justified by both local and general as well as scientific considerations. First of all, it does not seem to be an unfitting subject to bring to your notice in the town which bred Charles Dickens and Walter Besant, who devoted their unrivalled literary talents to depicting scenes and characters drawn from our slums, and such as our slums are only too familiar with. Secondly, although this borough has witnessed some of the most brilliant pageants and displays in the history of this country, and although you are sitting here in what we are proud to think is one of the finest town halls in the kingdom, yet there is an obverse to the shield, and round the corner we can introduce you to slums as pestilential and overcrowded as any to be found in the land. Further, although the environment of the wage-earning classes, in our industrial centres, and its effects may in part be a sociological question, I have endeavoured to show that it is inseparably linked up with, and *is* in fact the greatest of all our problems of preventive medicine, the most rational and the most scientific of all medicine. And if this is so, then it is up to the medical profession, both individually and through this great Association of medical men, to educate and lead public opinion in this matter, and to strengthen the hands of governments and local authorities, on whom will ultimately devolve the responsibility, no less than the odium, of providing the remedy. Concentration on the prevention of disease, on strengthening resistance to disease, by the improvement of environment, rather than on the search for cures or palliatives when the damage is already done; more attention to stimulating and fortifying the natural defensive mechanisms against disease, less to direct attack on disease itself; as Professor Wynne so ably put it last year, concentration on the environment rather than on the individual—this appears to me to be the most scientific, the most economical, and the most productive means of combating the worst of the evils from which the community suffers. If, in conclusion, I might sound a personal note, it is this—that as Chairman of the Health and Housing Committee of this great borough, by the goodwill of my colleagues on the Council, this is a conclusion forced upon me by no mere theoretical considerations, but by an everyday acquaintance with undeniable facts.

British Medical Association.

REPORT ON WORK OF SCHOLARS AND GRANTEES.

THE following is an account of the results of work done by the Research Scholars and Grantees of the Association during the year 1922-1923 and reported to the Science Committee at its meeting on July 3rd.

SCHOLARSHIPS.

Dr. H. A. HARRIS (Ernest Hart Memorial Scholar) has made a detailed study of a foetus presenting a combination of anomalies. In addition to numerous anomalies in the skeleton, the left lung and pleural cavity were absent, the oesophagus was interrupted at the level of the seventh cervical vertebra, and in place of the left bronchus was a narrow canal continued into the distal part of the oesophagus. From the left ventricle there arose a right systemic arch giving off the left carotid, right carotid, and right subclavian arteries. From the right ventricle ascended a left systemic trunk, giving off a right pulmonary artery and continuing as a left arch to join that of the right side, after giving off the left vertebral and subclavian arteries. A small communicating vessel united the ascending portions of the two arches. A full account is given in the *Journal of Anatomy*, vol. 57, 1922.

Dr. Harris has also examined three anencephalic foetuses; in all both the pituitary body and the intermediate zone of the suprarenal cortex were well developed. He has investigated the effects of disease on bone growth. In the case of a patient who had two severe illnesses at an interval of eight months, the alteration in the structure of the bones, as shown by radiograms, demonstrated clearly the amount of growth during that interval. From an examination of children and animals Dr. Harris concludes that (1) enlargement of the ends of the long bones is, within wide limits, normal; (2) the degree of enlargement is in some diseases greater than in rickets; (3) in many cases beading of the ribs may be confined almost entirely to the deep surface; (4) the "rickety rosary" and "cranio-tabes" are of less value than the radiogram in diagnosing the disease.

Dr. R. ST. A. HEATHCOTE (Research Scholar) has studied the action of camphor, menthol, and thymol on the circulation. The action of these drugs on the isolated perfused heart was found to be, in every experiment, purely depressant; both rate and amplitude of beat were reduced, the effect being due probably to direct action on the cardiac muscle. The action of camphor on the chloralized heart was also studied. After a short perfusion with choral the heart beat became slower and the amplitude less. On changing to the mixture of camphor and chloral there occurred a rapid decrease in amplitude and rate, and no sign of stimulation of the chloralized heart was ever seen. The coronary flow was increased by all three drugs. Experiments on the circulation were performed on decerebrated cats, a solution of camphor in olive oil being injected subcutaneously or intravenously; a gradual fall in blood pressure was produced. From these experiments it was concluded that camphor possesses no value as a cardiac or circulatory stimulant.

Dr. Heathcote has also studied the active substances in squill. He has separated three substances — a glucoside fraction, a resin, and a third body, of unknown constitution but probably a derivative of the glucoside. The first resembled closely the glucosides prepared from digitalis and strophanthus in all respects. The resin was found to depress the rate of the heart and also to dilate the vessels, both coronary and systemic. The third body resembled in its actions the glucoside, but had only about one-third of its activity.

Dr. S. W. F. UNDERHILL (Research Scholar) has investigated the influence of the hydrogen-ion concentration of the environment upon the activity of smooth muscle (isolated ileum of the rabbit or cat). In the ileum it was found that a sudden alteration to the acid side of neutrality caused a diminution of tone with a decrease in the contractions, while a corresponding sudden change to the alkaline side caused an increase in tone with a less

marked depression in the size of the contractions. When, however, the change was made slowly, the alteration of tone was either absent or much less marked, and the effects on the size of the contractions could be more readily studied. Passing from neutrality towards the acid side an increase in the height of the contractions was frequently seen, before the depression, which occurred in the neighbourhood of *p*H 6.5, appeared. Passing to the alkaline side, there was again a gradual depression of the contractions as the *p*H approached 8.0. After depression by either acid or alkali, a change in the reversed direction improved the contractions; in other words, the intestine beat best in a medium of which the *p*H was near 7.9. Experiments were also made on isolated rings of the inner part of the circular muscle of the ileum, into which nerve cells are not considered to penetrate. No alteration of tone occurred in response to changes in the *p*H of the surrounding medium; but an acid reaction slowed the contractions. Dr. Underhill considers it possible that the alterations in tone were due to an influence upon the nervous structures, while the alterations in rate were an effect upon the muscle fibres themselves.

Dr. J. V. WALSH (Research Scholar) has performed a large number of experiments to elucidate the differences observed between individual colonies of a pure culture of certain members of the intestinal group of bacteria. These variants are of two types and have been designated smooth and rough. Experiments to ascertain the conditions governing the appearance of the rough forms had reference to the influence of growth in agar and broth. The work is incomplete and conclusions cannot be drawn at this stage, but the experiments show that a definite cycle of changes takes place, the rough forms appearing after varying times of incubation, and increasing to a maximum followed by a sudden drop and disappearance. An experiment to endeavour to maintain rough forms in a stable condition resulted in the observation that it was possible to do so by transferring colonies from agar-plating to agar-plating without passing through broth.

GRANTS.

Dr. A. COMPTON has investigated the hydrolytic activity of the serum of different animals on maltose. He has found maltase present in the serum of the dog, goat, horse, pig, rat, and sheep; and absent from that of the cat, guinea-pig, rabbit, and man. He has further noted a great variation in enzyme activity from dog to dog under various modifying conditions, but marked stability for the individual. In a subsequent series of experiments he has shown that the enzyme maltase in the blood of the dog exhibits from animal to animal a constant optimum temperature of 55° C., at which its action is most potent. This is in contrast with the variability which characterizes the actual amount of enzyme present at any time in the blood of different animals. Full details have been published in the *Biochemical Journal*, vol. 15, 1921, p. 681, and vol. 16, 1922, p. 460.

Dr. M. COPLANS has tested the value of a bacteria-free vaccine lymph which he has prepared. The lymph can be prepared in the short period of five days, and the special bactericidal material employed is brilliant-green, which at the end of the period is converted into the colourless and inactive leuco-compound by addition of sodium hydrosulphite. The leuco-compound is comparatively inert both in bactericidal and vaccinicidal action, the potency of the lymph being retained at a temperature of 4° to 6° C. during a period of two years. Subcutaneous injections of the lymph were made in 33 cases. In the unvaccinated cases the onset of local reaction occurred in 5 to 10 days, in the vaccinated cases from 6 to 9 hours only. There appears, therefore, in the case of vaccinated persons to be a clear gain of 5 days in the onset of the reaction as compared with vaccination by skin scarification. Further experiments were made to ascertain how far inoculated animals would tolerate intraperitoneal injections of fully potent lymph, and the degree of immunity attained as shown by subsequent refractoriness to vaccination of the cornea or skin. It was found that both eye and skin eruptions were profoundly modified if not altogether abolished.

Dr. LOUIS GROSS has studied the dynamics of the intestine in cases of vitamin-deficiency. A slip of ileum from a rat fed on adequate vitamin diet gave tracings showing: (1) Regular beats, 29 to 25 a minute, with amplitude of 2 to 3 mm., (2) regular periodicity of groups of beats resembling a tracing of Cheyne-Stokes breathing. A strip of colon gave a fairly regular beat of 2 to 3 a minute. The same test applied in the case of rats fed on a diet deficient in vitamin B showed: (1) For the ileum, often irregular beats, 28 to 27 per minute, with amplitude of 1.25 to 2.5 mm. (2) The periodicity was at times completely lost, or so altered that the periods of rest were greater than the periods of normal beats. (3) In most cases the strip of colon failed to show any myogenic contractions. Macroscopic examination revealed (*a*) increased tendency to dilatation of the ascending colon, (*b*) stagnation of faeces in the descending colon, (*c*) enlarged peri-ileo-caecal glands, small spleen, small thymus, and dilated stomach and small intestine. The adrenaline content of the adrenal glands was well above normal, and the adrenaline content of the blood increased. From the above observations it appeared that a diet deficient in vitamin B produced well marked evidence of general intestinal stasis.

Dr. IVAN DE BURGH DALY (Research Grantee) has reported on the action of caffeine on the electro-cardiogram of intact animals, that (1) the heart rate increases, (2) the P-R interval if changed is slightly reduced, (3) the height of the R wave is reduced, (4) the S depression is slightly reduced, (5) the P and T waves are increased, (6) a T wave initially negative becomes more so and a T wave initially positive becomes more positive, (7) there is a tendency for the level of the curve between R and T to be raised. Experiments with the heart-lung preparation have shown that (1) the systolic and diastolic heart volumes are slightly decreased with small doses, (2) the venous pressure may be slightly lowered with small doses, (3) with larger doses the systolic and diastolic volumes are markedly increased and the venous pressure rises.

Dr. HELEN LEYTON has furnished a note on an investigation, carried out by herself and her late husband, on the influence of sugar in the diet on the total blood sugar in rats. The rats which had access to sugar in addition to the ordinary diet showed a variation between 0.07 per cent. and 0.26 per cent., average 0.18 per cent. of blood sugar. The controls, which were fed on ordinary diet, namely bread, water, and crushed oats, showed a variation between 0.05 per cent. and 0.08 per cent., average 0.07 per cent. The percentage was thus raised to the average of that found in human beings who normally take sugar in the diet.

Dr. E. P. POULTON (Research Grantee) has shown that distension of the stomach is an important element in the production of pain in cases of gastric ulcer. The experiments consisted in careful distension of the stomach with air introduced through a soft rubber tube and under measured pressure. Further experiments were made by introducing bags containing water or air, connected with a recording apparatus, into the oesophagus, stomach, duodenum, or jejunum. It was shown that pain in the upper alimentary tract was associated with movements in the oesophagus, stomach, duodenum, or jejunum. Pain was abolished by a successful contraction of the viscus. It was felt during the relaxation of the muscle after contraction. Pain is felt during contraction if the latter is not effective. Dr. Poulton read a paper before the Medical Section of the Royal Society of Medicine on January 25th, 1921.

Dr. J. ST. G. WILSON, who has investigated immunological factors in pregnancy at the Thompson-Yates Laboratories, University of Liverpool, has submitted a report on the complement-fixation reactions of pregnancy. The conclusions are in the main negative.

Professor A. W. SHEEN has completed his research, the results of which were set out in a joint paper by him and Professor Swale Vincent, published in the BRITISH MEDICAL JOURNAL of March 4th, 1922, entitled "The function of the chromaphil tissues in relation to splanchnic stimulation."

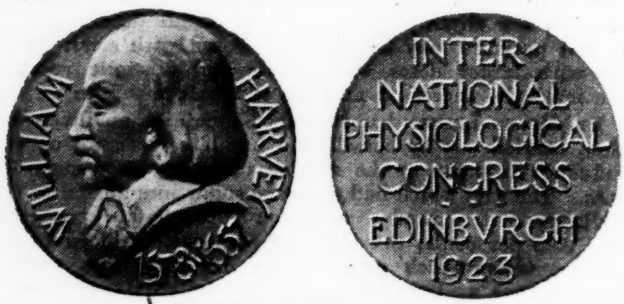
INTERNATIONAL PHYSIOLOGICAL CONGRESS.

MEETING IN EDINBURGH.

THE eleventh International Physiological Congress is being held in Edinburgh this week under the presidency of Professor Sir EDWARD SHARPEY SCHAFER, who was in the chair at the first General Session on July 24th. Captain WALTER E. ELLIOT, M.B., Ch.B., M.P., Under Secretary for Health for Scotland, on behalf of the Government extended a cordial welcome to those attending the Congress and especially to those members who had come from distant places. He was followed by Sir THOMAS HUTCHISON, Bt., Lord Provost of Edinburgh, who welcomed the Congress on behalf of the City; the Congress, he said, was remarkable in that those attending represented no fewer than twenty-one different countries. Principal Sir ALFRED J. EWING, K.C.B., then welcomed the Congress on behalf of the University of Edinburgh; he mentioned the fact that the University had possessed a Chair of Physiology for two hundred years.

President's Address.

The PRESIDENT (Sir Edward Sharpey Schafer) said that the several speeches of welcome had become progressively more intimate; beginning with the country at large, passing to the City of Edinburgh, and ending with the University. It was now his pleasant duty to tender the most intimate welcome of all, that of British physiology. Pointing to a bust of William Harvey, he said that the members of the Congress were invited to accept as a memento of the occasion a medal designed from that bust, a counterfeit presentment of the greatest of all British physiologists. The sculptor, Mr. Pilkington Jackson, was to be congratulated on his success; it had been necessary for him first to model a bust from authentic portraits of Harvey in order to obtain such an aspect of the subject as was demanded for the execution of a medal. "It is," the President continued,



"a far cry from Harvey to Lister, and many names eminent in British physiology intervene, but I desire especially to associate the name of Lister with this gathering, partly because he was for several years professor of surgery in this University, but chiefly on account of the fact that the researches which preceded his great discovery were researches in pure physiology, and were inspired by that great teacher William Sharpey, who migrated in 1836 from Edinburgh to London, and to whom I myself and many other British physiologists owe directly or indirectly their introduction to our science. Incidentally, it will be of interest to you to know that both Harvey and Sharpey were born in the same town—Folkestone—although at an interval of more than two hundred years. The countrymen of Harvey and Sharpey and Lister tender a cordial welcome to the countrymen of Vesalius and Van Helmont, of Magendie, Claude Bernard, and Pasteur, of Sylvius, Boerhaave, and Donders, of Caesalpinus, Fabricius, and Malpighi, of Michael Servetus, and of Albrecht von Haller, to mention but a few of the great names which are associated with our science."

The President then mentioned the names of physiologists who had died since the last meeting of the Congress, and concluded by saying that it was fortunate for the president of a Physiological Congress that he was not expected to give an account of the progress of the science since the preceding meeting. The task would indeed be difficult in view of the complexity of the science and the small part of it any one person could be expected to master. In view of the interest lately aroused and still existing, not only among physiologists but amongst physicians and even the general public, in the internal secretion of the pancreas, a subject especially connected with the activities of the Toronto school, Dr. Macleod, the distinguished professor of physiology in the University of Toronto, had been invited to give a lecture on insulin.

INTERNATIONAL CONGRESS OF SURGERY.

(*Continued from page 124.*)

ARTHROPLASTY.

THE discussion of the International Congress of Surgeons on Wednesday morning, July 18th, dealt with the subject of arthroplasty. All the speakers were good, but the masterly speech, cinema display, and exhibition of cases by Dr. Putti of Bologna earned him a personal triumph.

Mr. E. W. HEY GROVES (Bristol) said that arthroplasty should be defined as an operative procedure upon an ankylosed joint which had the object of restoring mobility. The pseudo-arthrosis which sometimes resulted from a simple fracture proved that a new joint could be formed, including interarticulating ends of bone, capsule, and synovia, without any elaborate plastic operation under the influence of constant movement. But such a joint was unstable and always developed the features of osteo-arthritis.

Clinical evidence on the question of arthroplasty had accumulated slowly since, ten years ago, Murphy had described his methods of operative mobilization on hip- and knee-joints. It was still conflicting. There had been many disappointments. The operation upon the hip, the one usually tried, was very serious and had a high mortality. Those recovering had only a very limited movement and the functional result tended to get worse with the lapse of time. New hope had been felt with regard to these mobilizing operations since the publications of Professor Putti had been considered. Arthroplasty could never create a normal joint, and the average result was a gain in mobility at the expense of strength and precision. In any given case the question was, Will the abnormal joint produced by the arthroplasty be more serviceable than the stiff limb which it is proposed to treat? The answer must be considered under three headings: The nature of the causative disease; the nature of the disability; and the circumstances of the patient.

With regard to the causative disease ankylosis resulting from trauma, pyaemia, or gonorrhoea in which infection was at an end gave the best results from arthroplasty. In such a disease as tuberculosis the majority of joints were unsuitable for the operation because of the latency of infection and the deep involvement of the bone ends, but in exceptional cases where the disease had been almost confined to the synovial membranes and the bones were formed and dense a good result might be expected. Selected cases of osteo-arthritis and rheumatoid arthritis might give a considerable measure of success. If ankylosis had taken place in good position and was bony and painless the joint should be left alone unless mobility would make it possible for the patient to carry out his occupation. But if the ankylosis was in a bad position, was painful, or the deformity progressive, choice had to be made between operative fixation and mobilization. Associated ankylosis of hip and knee on the same leg demanded mobilization of the hip, whilst ankylosis of both knees required arthroplasty on at least one of the joints. It was still the opinion in this country that bony ankylosis of the knee in good position should not be interfered with unless present on both sides. Youth was entirely favourable to arthroplasty provided that growth of bones had ceased.

There were six essentials in the operations. These were: To make a sufficient gap between the bone ends; to shape the articular ends and to cover them; to provide synovial fluid; to provide ligaments and prevent undue mobility; and to restore function.

Enough bone must be taken away at the time of the operation to allow full movement desired, but no more. It was wise to trust to other measures to prevent refixation. All possible fibrous tissue, and especially that of inflammatory origin, must be taken away from the site of the new joint. In shaping the bone ends the greatest possible width must be preserved in the articular surfaces. Instead of leaving the bone raw the cut surfaces might be rubbed with hard wax—a simple procedure, but not so efficacious as the use of tissue flaps. These flaps might be a foreign membrane, free fascia from the patient's own tissue, or pedicle flaps of fascia, muscle, and fat. Fascia lata was perhaps best, but all that it could do would be to provide a smooth covering

for the bone which would limit the formation of exudation, granulation, and fibrous tissue. It could not itself prevent adhesions. It must be fixed firmly in position. There were two conditions essential to provide a new synovial sac—there must be sufficient space between the bone ends, and there must be a gliding movement to stimulate the walls of the cavity to secrete a supply of fluid and to prevent fibrous organization. Attempts to provide a new synovia of olive oil or liquid paraffin had been unsuccessful. Continuous traction on the new articulation and early voluntary movements were the essentials of after-treatment.

In the elbow the indications included all cases of bony ankylosis free from active infection except those in which a strong useful arm was present in a labouring man. The best operation for the elbow was to preserve the whole width of the humeral condyles and to cover the bone with a free flap of fascia lata.

In the hip three different types of operation must be considered: For simple ankylosis an osteotomy of the neck of the femur with the interposition of a flap taken from the trochanter or from the capsule; for massive hypertrophic ankylosis a subtrochanteric osteotomy with the interposition of a fascial flap forming a saddle-shaped joint; for osteo-arthritis excision of the head of the femur.

In the knee the importance of stability and painlessness rendered unjustified any mobilizing operation if the joint was fixed in a good position. It was only in the case of ankylosis of both knees that arthroplasty could be considered. The use of free fascia to cover the lower end of the femur, the preservation of the lateral ligaments, and the use of a jointed knee cage for some months after operation were the special points on which stress must be laid. If lateral mobility persisted then the lateral ligaments must be reinforced at a second operation.

Dr. PUTTI of Bologna then gave one of the most striking demonstrations of the Congress. He illustrated his remarks on the knee by showing cinematographic films of patients who had suffered from ankylosed knees walking, running, and cycling many months after operation. Finally, he produced patients with easily flexible knees, the joints having little or no lateral mobility. There were, he said, general and specific indications for arthroplasty. The general ones related to: (*a*) The state of the patient, his age, his mental and social conditions, and his occupation. Arthroplasty was a long and traumatizing operation. It should, therefore, only be done on patients who were favourably disposed from the point of view of organic resistance. The best age was between 20 and 50. It was absolutely indispensable that the patients should whole-heartedly co-operate with the doctor. He never operated on subjects hypersensitive, neuropathic, irritable, or mentally deficient. Nor should an operation be done when the patient's means did not permit a long stay in hospital. The profession or calling of the patient must also be considered. (*b*) The etiology, pathology, and anatomical conditions of the ankylosis. Cases of traumatic ankylosis were the most favourable. In ankylosis consequent upon infective arthritis the most amenable to correction were those following an acute inflammation. Osseous ankylosis was easier to correct than fibrous. Ankylosis of tuberculous origin should only be operated upon as an exception. Good results might be obtained from cases of war ankylosis, arthritis deformans, or polyarticular arthritis. Operations should never be done less than a year after the disappearance of the more striking symptoms of the stiffening process.

There were absolute indications for arthroplasty in ankylosis of the mandible, in bilateral ankylosis of the hip, in ankylosis of the elbow in extension, in polyarticular ankylosis. In cases of bilateral ankylosis of the hip it was generally wisest to operate only on one side. As good results could easily be obtained in the knee as in the elbow. Incisions should be made in order to obtain a wide field of observation. Resections should not be too sparing in nature. An exact adjustment of the epiphyseal extremities of the bone should be made with files and drills; they should be covered with free flaps of fascia lata. The first passive movements should be begun twelve to fifteen days after the operation. Thermotherapy in the production of active hyperaemia should not be neglected. After arthroplasty of the lower limbs patients should not be allowed to walk before the thirtieth day. The new joint appeared as the result of function. Interposition of aponeurotic flaps greatly helped post-operative treatment. Their action was only temporary. It did not therefore matter that they would not keep indefinitely vital. The growth of a new joint was very slow. Examined long after operation it showed anatomical conditions very like a normal articulation. Functionally these cases did very well, becoming neither arthritic nor deformed. Their functional resistance was high for many years.

Dr. MACAUSLAND of Boston commenced by congratulating Dr. Putti on his brilliant demonstration. He stressed the point that an excision was not an arthroplasty, for which special highly developed technical skill was especially necessary and for which judgement in the selection of cases was very difficult. Ankylosis was due to an infection or to trauma. Gonococcal metastasis usually occurred in eighteen to twenty days, staphylococcal in ten to fourteen days, and those due to streptococci and the colon bacilli in eight to ten days. The synovia was first affected and, long after, the cartilage. Infections, acute or chronic, did not constitute a contraindication to arthroplasty provided that the process had not been tuberculous and was not active. A tuberculous joint, even when ankylosed firmly, might retain small walled-off foci through life, and therefore, except in cases of great rarity, should be considered a direct contraindication to any mobilization. Occasionally deformity of such a degree was present as to warrant correction before an arthroplasty was attempted. The hip, ankylosed in marked flexion and adduction, should be corrected by a preliminary procedure. Similarly marked flexion of the knee might necessitate treatment before the arthroplasty was done. Indications for the operation were: two stiff hips, indicating arthroplasty in one or both; two stiff elbows, two stiff knees, again indicating arthroplasty in one at least. Combinations of hips and knees very definitely indicated an attempt to mobilize one or more joints. Amongst the lesser joints were stiff shoulders, fingers, wrist (a very rare subject for the operation), and the jaw. The speaker then surveyed the development of the operation. Special reference was made to Dr. Baer for his work with chromicized pig's bladder and to the late Dr. J. B. Murphy for his advocacy of the pedunculated flap. Free fascia in the hands of Putti and Payr had been most successful. Dr. MacAusland made a comprehensive statement regarding each joint, stating indications and contraindications for operation, and described the general methods of treatment. With regard to the knee, arthroplasty should only be very cautiously advised in cases of ankylosis of one joint, in spite of recent advances. Lateral stability and security were here of first importance.

Dr. SANTY of Lyons said that surgical mobilization of ankylosed joints had as yet been little used in France. The reason was that they continued to use Ollier's mobilizing resections. For the shoulder, elbow, and wrist the mobilizing resection gave excellent results, but to obtain them great tenacity and a great deal of patience were required, not only from the surgeon, but also from the patient. Arthroplasty was unquestionably an improvement and gave better results. For the hip the mobilizing resection was sometimes indicated, as in the case of large bony fusions, rendering surgical modelling and interposition difficult and dangerous. Apart from these cases, arthroplasty was here also an improvement. In the hip and knee the operation opened a new chapter in articular surgery. Resection for ankylosis had become a secondary method, to be used only in cases where arthroplasty had failed, or in those rare cases where the state of the bony or, more rarely, the soft parts of the articulation made an attempt at mobilizing the joints unwise.

Sir WILLIAM MACEWEN remarked that Dr. Murphy had once said that all excisions resulted in flail joints; they knew now that if intracapsular incision was made no flail joint need result. He had been glad to hear that the function of the various flaps used was that of a limiting membrane. He had always said that the periosteum was only a limiting membrane.

Mr. ELMSLIE of London said that in any new operative procedure it was important to know how to carry out the technique and when to utilize it. Arthroplasty differed

from excision in aiming at a stable, strong, mobile, and painless joint. The new joint should be reasonably free from future complications. There were two indications for arthroplasty—to improve function and to diminish pain. Pioneer work carried out by surgical enthusiasts was often experimental and bore little relation to the problems arising in surgical practice. The fact that a stiff joint had been made to move might be more satisfactory to surgeon than to patient, whose interest was whether he could now do things and whether his limb was painless. In the lower limb he was strongly of the opinion that ankylosis of any individual hip, knee, or ankle in good position was preferable, both from the view of function and of pain, to the results obtained from any form of arthroplasty. After reviewing last year 2,000 children suffering from hip disease he knew that boys and girls with bony ankylosis of the joint could walk far better than those without. He would always prefer an arthrodesis as the operation of election in such a joint. Only in those cases in which there was double ankylosis of both hips, or of hip and knee, was arthroplasty desirable. Unfortunately, there were often especially difficult cases—those terrible instances, for example, of spondylose rhizomyelia, when both hips and perhaps both knees were stiff and often painful. In these cases the inflammatory process went on in the new joint and produced persistent stiffness and pain. He was not sure that an ankylosis of both hips in abduction and 35 degrees flexion was not the most satisfactory end in these cases. The problem was very different in upper and lower limbs. In hip and knee, weight-bearing joints, it was very difficult to get satisfactory movement. In shoulder and elbow it was easy to get free movement, but difficult to provide good function. The shoulder was difficult; its mechanism was complicated. He noticed it had been much neglected by enthusiasts. The elbow was easiest and gave the best results. Indications were ankylosis in extension; painful movements not due to inflammation; exceptional cases where movement was required for occupational reasons. Mr. Elmslie then described his technique in operating on the elbow-joint. Active movements were permitted as soon as the wound was healed. A flexing sling was used.

Sir W. I. DE COURCY WHEELER (Dublin) said that arthroplasty of the shoulder was preferable to fixation if movements of the scapula were limited and the deltoid sound. In working men a fixation operation was best. In these operations a painless result was all-important.

Dr. JIRASEK (Prague) indicated that in arthroplasties done in Professor Kukula's clinic in Prague the interposition method was used: omental fat was used in 9 cases, subcutaneous fat in 7 cases, free fascia in 9 cases. Results showed that in 13 knee operations there was a return of complete mobility in 77 per cent., in 9 elbow cases 88 per cent. were entirely satisfactory, in 2 finger arthroplasties and 1 hip there was a 50 per cent. and 0 per cent. recovery of complete mobility respectively. Re-ankylosis was due to a return of the purulent or specific inflammation and to insufficient will of the patient during post-operative treatment. In interposition methods hope of a good result must not be bought at the expense of such an extensive resection as to cause a flail joint. He preferred fat grafts, easily obtainable by doing a small laparotomy, if subcutaneous fat were insufficient.

Dr. STONEY of Dublin advocated excision of the elbow in certain cases.

Dr. TUFFIER suggested the use of a small metal hinge, attached to adjacent bones, to keep the joint surfaces at a uniform distance apart.

Dr. A. JURAEZ (Poland) based his experience upon work done in Payr's clinic, where he had seen 150 cases of mobilized joints, and upon 24 operated cases of his own. There were patients who showed great pluck and energy before operation, and afterwards, owing to too early movements involving great pain, soon lost this early well-being. He considered a rational psychical treatment before and after operation of the first importance. In elbow cases he began movements not before a week after operation; in knee cases after two to three weeks; in hips after four weeks. In the meantime the limb was splinted or in plaster. The first movements merely consisted in changing the position of the extremity in the operated joint once or twice a day. As to the time after an infection of the joint in which it was permissible to operate he used a simple test. Hyperaemia was administered to the joint, best by diathermy. Swelling and pain indicated an infective process. He removed the diseased synovia and all cicatricial tissue, but was very careful to spare as much as possible of the soft tissue—especially the lateral ligaments. It was important to remember the stabilizing effect of the ilio-tibial band in the knee-joint. For hip operations he used Ollier's incision and chiselled off the great trochanter; in knee mobilization the longitudinal S-shaped incision of Payr with separation of the vastus medialis from the quadriceps and fixation of the patella externally. He had learnt that day to use Putti's incision in rare cases where there was insufficient room. The elbow and hip gave the best results.

Drs. VILARDELL, CORACHAN, RIBAS Y RYBAS, PINZI Y SUREDA (Barcelona), and ZAHRADNICKY also spoke.

INJURIES TO THE PERIPHERAL NERVES.

Dr. HENRIKSEN of Skien opened the third discussion. He said that much loose work had been done on nerve regeneration. Histological restitution was not proved to exist till nerves had been discovered of the same type as the nerve fibres, with axis cylinder, medullary sheath, and neurilemma nuclei. The process of regeneration must be followed up to the very formation of fully organized myelin fibres. Careful investigations of the conductive power of the nerve must be carried out. After a peripheral nerve had been cut with a sharp instrument it showed a pronounced disposition to heal spontaneously without leaving any permanent injury. Sensibility reappeared as soon as there was contact between the nerve ends, and motility in the course of two months. A similar return of function occurred as in spontaneous healing if the suture had been correctly performed with good adaptation and no tight knots.

Healing might be prevented as a consequence of the nerve ends being separated by displacement in other strata, by interposition of fat, or cicatricial tissue the result of infection. After a properly performed secondary suture return of sensibility set in at once. Motility and electrical reaction might appear in the course of two months and develop almost as after primary suture. If the nerve had been injured by blunt force, crushing, or tearing, the neurilemma nuclei were injured and part of them completely destroyed. Many of the newly formed nerve fibres were incapable of living and degenerated again. If the neurilemma nuclei were destroyed no new nerve fibres were formed and the nerve atrophied. The changes were most pronounced at the very spot of crushing where the nerve adhered to its surroundings. Improvement might be obtained in some cases by freeing the nerve and resecting the thickened fibrously infiltrated part. Then such degree of function was secured as the general condition of the nerve rendered possible.

Dr. GOSSET of Paris presented a table showing his war results in the various nerves operated upon. The percentages were of cures or of considerable amelioration of symptoms.

Nerve.	Freeing of Nerve.	Suture.
	Per cent.	Per cent.
Radial	95	45-55
Median	47	44
Ulnar	43	17
Great sciatic (1917)	55	35
,, (1920)	—	40
External popliteal	66	50
Internal popliteal	—	40-50

The radial nerve was particularly favourable to regeneration. Even if the regenerated fibres had not passed down as far as the hand most of the muscles were reinnervated. Moreover, the nerve was so far from large vessels that a missile rarely wounded at the same time nerve and artery. Circulatory troubles and causalgia seldom developed in cases of radial paralyses. All other nerves could be said to give very variable results. Causes of failure were of three types. First, there was the defective operation.

tension on the suture led to many bad results; fibrous nodules on the nerve must be removed. Two difficulties had to be faced: there was the possibility of resecting too little and making a bad suture, or of resecting too much and not being able to suture at all. The next cause of failure was faulty downgrowth from the nerve. It was best to suture early; to intervene late was preferable to not operating at all. The third cause of failure was the bad state of the paralysed limb. After careful study of many cases he thought that grafting of nerve tissue should only be very rarely done. It should be reserved for cases where there was great loss of nerve substance, making suture impossible even after flexing the limb. In these cases it was the best method of treatment. Although Nageotte, Guyon, and others had obtained excellent results in animals by heterografts, in the living man the autograft was better. For causalgia many operations had been attempted: complete section of the nerve with or without suture, neurolysis, hersage of the nerve, injection of alcohol, periarterial sympathectomy (the procedure most favoured at the present time), periarterial and perivenous sympathectomy, section of the posterior roots with sympathectomy, ionization, radiotherapy, etc.

1. What were the nervous wounds that should be operated on?

(*a*) He thought that all the cases of progressive compression that grow worse and led to the syndrome of serious irritation or interruption should be operated on. For those cases he would reserve liberation; it could in no way hurt either the subject or the nerves, and he did not see any advantage in postponing the operation.

(*b*) All the cases of complete interruption, clinically observed by competent neurologists after repeated examinations, and which showed no sign of regeneration, or useless signs of regeneration, like zones of limited stationary paraesthesias, and which showed no signs of improvement, should be operated on.

(*c*) For causalgias and serious neuritis recourse should be had to an operation, but there were no fixed rules.

2. When should they operate?

(*a*) The lessons of war surgery, which tended more and more to favour prompt operations, had shown them that they certainly had the right, even the duty, to examine during the preliminary surgical cleaning of the wound, the state of the important vessels and nerves. This was still more necessary if, from the first day, there were signs of paralysis of a large nervous peripheral trunk, which should be verified easily. Any severed nerve should be at once stitched up so as to permit of rapid regeneration and thus, moreover, avoiding the deviation or the formation of sclerous tissue; in the case of a bruised nervous trunk, its preservation and constant observation seemed to be preferable.

(*b*) If some time had elapsed before the wounded subject had received medical attention, the diagnosed lesion should be operated on as quickly as possible. Nevertheless, it was necessary to wait until the suppuration, the osteitis, the inflammatory symptoms had disappeared for some weeks. Aseptic operation was necessary.

3. What was to be done?

(*a*) Simple liberation, with replacement between healthy muscles, was applicable to the syndromes of compression and of irritation. The enucleation of small intrafascicular fibromas should be practised only when it was without danger to the healthy nervous fascicles; the intranervous extraneous bodies should always be taken out.

(*b*) Should the interruptions be several times examined without any improvement being remarked, resection of the fibrous callus and neurilemmatic suture uniting two permeable ends, without traction at the level of the suture threads, should be practised. If suture was impossible, a graft, or the dividing into two of the lower end (disguised graft), should be practised. Useful results would be obtained only if the wounded subject had been kept without ankylosis, without muscular retraction, during the time preceding the surgical treatment. This treatment should not be given up too early, because experience had shown that it depended on the nerves themselves affected, on the suture or the graft, whether the period of regeneration might last from eighteen months to several years.

Two cases were to be distinguished. In war surgery, as well as in civil surgery, immediate suture of the nerves should normally be completely successful. Delayed surgical treatment might give good functional results in 40 to 50 per cent. of the cases, according to the nerves, when it had been performed from one month to two years after the wound. After that time it should nevertheless be tried; it might be successful, but they agreed with most medical authorities that there was less chance of its succeeding. Nevertheless, the surgical treatment of the big nervous trunks was not by any means illusory if it was carefully and systematically practised by specialists who were equipped for that purpose, and when the patient could be kept under prolonged observation. In those circumstances satisfactory results might be obtained.

Dr. FRAZIER of Philadelphia stated that, of 208,000 casualties in the American Expeditionary Forces, it was estimated there were 3,500 perpheral nerve injuries. With few exceptions no operations on these conditions were performed overseas. All were done by specially qualified men at twelve peripheral nerve centres in the United States. It was the general practice to postpone operation until three months after the wound had healed. To wait for spontaneous regeneration longer than six months was not considered justifiable, although it was well known that the first clinical sign of spontaneous regeneration might be deferred much longer. He had seen one case of musculo-spiral paralysis in which the first sign of the return of voluntary motion did not appear till twenty-one months after injury. During the period of reconstruction he relied upon the various signs of recovering function to determine whether spontaneous regeneration was in process or not—signs such as contraction of the field of sensory loss, the return of muscle tone, the changing electrical reactions, and the advancement of Tinel's sign. This latter, however, was not an infallible guide. In 1922 a more accurate clinical method of determining the early recovery of a degenerated nerve was elaborated. With the aid of a specially constructed chrinomyometer the nerve muscle complex was found to disappear as early as the fifth day after the nerve was cut, and it began to appear from one to six months before a faradic response, from one week to three months before voluntary contractions, and up to five months before contraction of the anaesthetic area. If, six months after injury, the lesion was stationary, when there was evidence of complete anatomical interruption, when there was an interstitial neuritis or a neuroma in continuity without response to stimulation (especially if the neuroma were imperfectly encapsulated), operation was recommended. The damaged nerve should be resected sufficiently to expose normal fasciculi above the seat of fibrosis. Coaptation was effected with six to eight epineural silk sutures, and, when required to relieve tension at the line of suture, a stay suture of catgut was employed. Partial resection was rarely indicated. A nerve bed free from scar tissue must be provided at the line of suture and the protection of the line of suture with any foreign tissue—fascia lata, veins, or Cargile membrane—had been generally condemned. With regard to bridging defects, primary nerve stretching, nerve transposition, and the two-stage operation were the selected methods, in the order named. The two-stage operation virtually eliminated the necessity for transplantations. Nerve distortion must be avoided. A sensory fasciculus could not function as a motor fibre, and *vice versa*. With regard to end-results, he presented a table of 487 operated cases, including 132 neurolyses, 350 neurorrhaphies, and 14 transplants.

Nerve.	Good.	Mediocre.	Negative.
	Per cent.	Per cent.	Per cent.
Brachial plexus	33	37	29
Musculo-spiral	23	30	46
Median	58	28	14
Ulnar	12	55	31
Sciatic	25	41	33
External popliteal ...	31	52	16
Internal popliteal ...	46	46	8

Recoveries Seen in True End-Results.
(157 Suture Operations at Grangethorpe Hospital, Manchester.)
Professor J. S. B. STOPFORD.

Nerve.	Number of Operations.	Motor Function.					Sensory Function.			
		Proximal Muscles *plus* Distal Muscles (Total) (Complete Motor Recovery).	Proximal Muscles *plus* Distal (Partial).	Proximal Muscles Alone.	Distal Muscles.	No Motor Recovery.	Protopathic Recovery Alone.	Protopathic *plus* Epicritic (Partial).	Sensory Complete.	No Sensory Recovery.
Musculo-spiral ...	37	20	16	1	—	—	—	—	—	—
Ulnar—	38									
Upper arm ..	19	None	12	7	—	—	9	4	None	6
Forearm ..	19	—	—	—	Hypothenar alone 8. Hypothenar and 1 other, 9. 1st dorsal interosseous 1	1	6	9	1	3
Median—	43									
Upper arm ...	22	None	7	15	—	—	11	6	None	5
Forearm ...	21	—	—	—	9	12	9	10	None	2
Sciatic	27	None	None	27 (I.P. and E.P. muscles 20, I.P. alone, 7)	—	—	16 (incomplete 14, complete 2)	6	None	5
External popliteal	12	—	—	6 complete, 6 incomplete	—	—	6	None	4	1

Transplants, in spite of the brilliant results of the experimentalists, had been a failure. It was his opinion that after the lapse of five years the question of re-exploration should be considered in all cases of total failure.

Dr. CHIASSERINI (Rome) read Dr. Verga's paper. Perfect recovery after nerve injury was very rare. The percentage of improvement and of recoveries obtained by the writer in 82 cases observed for longer than one year after intervention were: 52.4 per cent. of recoveries, 37.8 per cent. of improvements, and 9.7 per cent. negative results. Out of 9 cases observed up to six and a half years after operation, only once a change for the worse had been observed, and only once restoration stopped. In all the cases improvement had been the rule, which showed that improvement was a question of time. The results obtained from suture and neurolysis were quite superior to those of all other operations.

Dr. LERICHE of Lyons expressed himself as being more and more convinced that causalgia was the consequence of a peripheral sympathetic lesion, or, if they preferred it, a vasomotor syndrome. In wounds involving arteries it was not the arterial lesion, but the periarterial sympathetic which mattered. Causalgia could be produced through the accidents and wounds of civil life. The malady, like any other of vasomotor origin, had two phases—a peripheral and a radico-medullary type. Operation could relieve the first phase. In the second radicotomy was not always sufficient and a chordotomy was sometimes necessary. Of peripheral operations he had had experience only of sympathectomy. Failures came through allowing the disease to enter on its later type and through operating in the wrong place. He had sometimes used heterografts of veins from calves or rabbits. An autoplastic graft was much preferable to the dead heteroplastic graft of Nageotte. To cause trophic symptoms in limbs it was necessary to add trauma to an already existing nerve trouble. Resection of the neuroma and simple liberation was followed by temporary cure; resection followed by reconstruction had led to cure in favourable cases. For trophic limbs he recommended periarterial sympathectomy or the reconstruction of the nerve by graft, with or without sympathectomy.

Mr. PLATT of Manchester and Mr. BRISTOW (London) presented the British report.

Mr. PLATT said that there was no doubt that results in general had fallen below their earlier expectations. He gave a list of true end-results in 157 suture operations collected by Professor J. S. B. Stopford of Manchester. (See table above.) Even in radio-spiral nerve recovery, the best of any, normal synergic action of the extensors of the wrist was lacking. Neurolysis should be regarded as a necessary step in every efficiently conducted exploration and repair of an injured nerve. In cases of failure and partial failure after operations on the musculo-spiral nerve the results of tendon transplantation had been strikingly good. In this operation the pronator radii teres was transplanted into the extensor carpi radialis longior and brevior; the flexor carpi ulnaris into the extensor communis digitorum and extensor longus pollicis and the flexor carpi radialis into the extensor ossis metacarpi pollicis and extensor brevis pollicis.

Mr. BRISTOW quoted with approval the report published by the Medical Research Council in 1920: "Lateral implantations and flap operations are only mentioned here to be condemned." With regard to pathology an interstitial fibrosis and an ascending toxic neuritis occurred in the nerve proximal to the injury. Distal to suture occurred a tissue reaction due to the stitch itself and to sepsis, even when mild, fibrosis and shrinkage of the neuroma after its formation, and compression by fibrous tissue.

Mr. YOUNG of Glasgow presented reports of over 300 cases. He spoke of the technique of nerve operations. The parts should be disturbed as little as possible consistent with thorough liberation of the ends. Nerves should be dried in the air as little as possible. Thin catgut should be used. He regarded the use of a non-absorbable material such as silk unjustifiable in nerve suture. Sheathing of the reunited nerve might be accomplished with vein, fat, muscle, fascia, tendon sheath, or other material. He believed the best form of sheath was made from loose fatty tissue taken from the vicinity of the wound or the chest wall. He thought there was a fundamental error in thinking of the mechanism of nerve repair as different from that of other tissues. It was really the same. In all they must depend on the vitality of the essential cell of the tissue involved. Hence minimal operative trauma in order to avoid muscular interference and perfect asepsis must be the surgeon's aim.

Dr. CHIASSERINI of Rome discussed the question of grafting. He believed that many of the poor results observed in men after nerve grafts were due to faulty technique; the use of too thin grafts; primary tubulization of fresh grafts; suture not correct; adhesions preventing normal growth of fibres, and no after-treatment. He agreed with Elsburg in saying, "the era of peripheral nerve surgery is still to come."

RECEPTION AT THE ROYAL COLLEGE OF PHYSICIANS.

A reception for members of the Société Internationale de Chirurgie was given by the President and Fellows of the Royal College of Physicians of London on Thursday afternoon, July 19th. The guests were received in the large library by the President, Sir Humphry Rolleston, who was accompanied by the censors, the registrar, and the Harveian librarian. A number of books illustrating the history of anatomy and surgery were placed on view. The library of the College contains an unusually large number of early anatomical and surgical works, and the history of anatomy and surgery from the fifteenth to the nineteenth centuries could be studied in the books exhibited. Special care had been taken to show as many books as possible written by anatomists, whose names are remembered to-day because they have been given to various parts of the human body. Besides the exhibition books of this character other rare books and manuscripts more particularly connected with the history of the College were on view, and visitors had the opportunity of seeing the oil portraits on the walls to the number of some 120, which illustrate the work of many British portrait painters from the seventeenth to the nineteenth centuries.

RECEPTION AT THE ROYAL COLLEGE OF SURGEONS.

A reception was given on July 19th by the President and Council of the Royal College of Surgeons of England in the College, when the guests were received by the President, Sir John Bland-Sutton, and the Vice-Presidents, Sir Berkeley Moynihan, Bt., and Mr. H. J. Waring. The visitors were guided through the museum by the conservator, Sir Arthur Keith, F.R.S.

Demonstrations.

During the meeting a number of demonstrations were given, including one by Sir Charles Ballance on nerve suture, and another by Sir Almroth Wright, at St. Mary's Hospital, on the practical application of points mentioned in his address on vaccino-therapy and sero-therapy. The members of the Society had the opportunity of visiting various hospitals each morning and witnessing operations.

(*To be continued.*)

TEACHING OF OPHTHALMOLOGY TO MEDICAL STUDENTS.

We have received for publication from the Council of British Ophthalmologists the following correspondence which has passed between it and the General Medical Council:

To the Secretary, General Medical Council.

28th March, 1923.

Dear Sir,

The Council of British Ophthalmologists begs to draw the attention of the General Medical Council to the following statement in the final report of the Departmental Committee on the "Causes and Prevention of Blindness," which has recently been published:

"We recognize that the inadequate knowledge of diseases of the eye possessed by the large majority of the medical profession on admission to the *Register* is in a large measure due to the very limited amount of training in this subject which they receive as medical students. With a few exceptions the universities and examining bodies in Great Britain do not require candidates for a qualifying degree or diploma to be examined in ophthalmology. It is true that questions on ophthalmic surgery are occasionally included in a paper or in the oral examination, but these can in no sense be considered as an adequate test of the candidate's knowledge of this subject.

"In our opinion no licence to practise medicine should be granted without satisfactory evidence of an adequate knowledge of diseases of the eye. The supervision of the medical curriculum and qualifying examinations is in the hands of the General Medical Council. This body demands of medical students three months' attendance in an ophthalmic department, but representations of the inadequacy of this regulation have failed to produce any stronger insistence on more effective training in ophthalmology.

"We recommend that the General Medical Council again be urged to insist that every student presenting himself for a qualifying examination in medicine shall be examined in ophthalmology."

This recommendation of the Departmental Committee, which was composed of both laymen and medical men, is entirely in keeping with that submitted by the Council of British Ophthalmologists to your Council in 1919 (copy enclosed) in which it was suggested that: "No student shall be considered to have passed the qualifying examination unless he has shown a sound knowledge of practical ophthalmology in an examination conducted by ophthalmic surgeons." The action which your Council took at that time was—

"That every student should be required to attend a course of practical instruction in ophthalmology of not less than ten weeks' duration and that no student should be admitted to the final examination unless he presents a certificate to the effect that he has attended such a course regularly, and that his work in connexion therewith has reached a satisfactory standard."

The Council of British Ophthalmologists wishes to point out that this arrangement leaves it entirely to the ophthalmic surgeon in charge to determine what the evidence of satisfactory work in his department should be, an arrangement which is not considered sufficient with respect to any other of the essential subjects in a student's curriculum.

Further, the Council of British Ophthalmologists has ascertained that in the London medical schools the evidence of satisfactory work is receiving very different interpretations. In one school every student is now required to pass an examination before his certificate is signed, in others mere attendance in an ophthalmic department is recognized as sufficient.

This difference in the interpretation of the General Medical Council's requirements causes not only a feeling of injustice amongst the students of the different schools, but is also eminently unsatisfactory in the want of uniformity in the standard of requisite knowledge which it sets up, and in placing the responsibility entirely in the hands of the teacher.

The experience of the Irish universities and colleges, in which an examination in ophthalmology has been for many years recognized as an intrinsic part of the final examinations for their degrees and diplomas, shows that there is no great difficulty in conducting such an examination.

The Council of British Ophthalmologists desires to point out that the adoption of its recommendation would not entail any modification of the curriculum already required by the regulations of the General Medical Council, but only that an effective and uniform test be applied to the knowledge which a student should have acquired in the course of the curriculum.

The recommendation of the Departmental Committee on the "Causes and Prevention of Blindness," coinciding as it does with the previously expressed views of the Council of British Ophthalmologists, encourages the latter again to urge the General Medical Council to insist by means of an examination in ophthalmology on a uniform standard of knowledge in this subject.

Yours very faithfully,
(Sgd.) J. B. LAWFORD, *President.*
M. S. MAYOU, *Hon. Secretary.*

General Council of Medical Education
and Registration of the United Kingdom,
London, W.1, 5th June, 1923.

The Honorary Secretary, Council of British Ophthalmologists, 59, Harley Street, W.1.

Dear Sir,

I have to inform you that your letter of the 28th March, drawing attention to the report of the Departmental Committee on the causes and prevention of blindness, was considered by the Examination Committee of the Council, and that the greater part of your communication was printed in full in the report made by them thereon to the Council.

This report was considered at the meeting of the Council held on the 1st of June, and I was directed to inform you that it is too soon to judge of the effect of the resolution recently adopted by the Council.

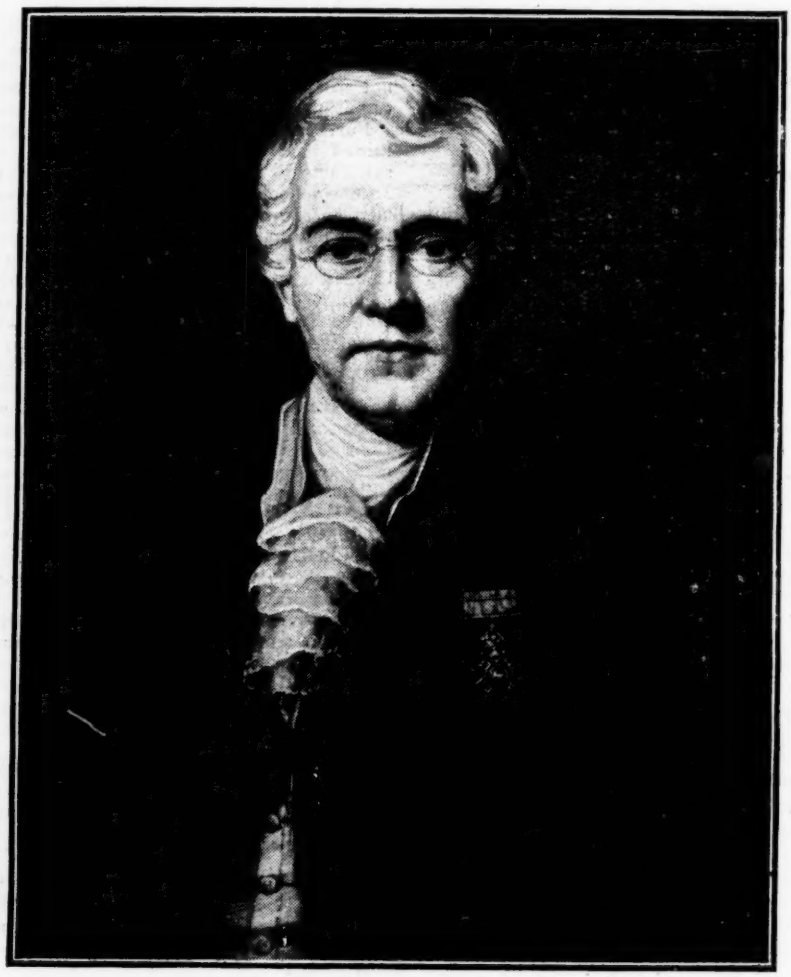
I might add that in regard to the paragraph in the report of the Departmental Committee I was directed to inform the Ministry that on May 25th, 1922, the Council made certain recommendations to the licensing bodies for the improvement of the medical curriculum, one of which was that each student should receive instruction, *inter alia*, in the diseases of the eye, refraction, and the use of the ophthalmoscope. The Council thereby anticipated the wishes of the Departmental Committee as set forth in their report, which was not published until the autumn of that year.

Yours faithfully,
(Sgd.) NORMAN C. KING, *Registrar.*

A PORTRAIT OF SIR CHARLES BELL.

SIR CHARLES BELL, who left Edinburgh for London in 1804, became surgeon to the Middlesex Hospital in 1814 and retained that office until 1836, when he returned to Edinburgh to occupy the chair of surgery. Bell taught in the Great Windmill Street Medical School, and was instrumental in founding the medical school of the Middlesex Hospital in 1835. Although Bell was as a man of science perhaps the most distinguished person ever connected with the Middlesex Hospital, the medical school has not hitherto possessed his portrait. This defect has now been repaired by the piety of Mr. Alfred E. Webb-Johnson, lecturer on practical surgery and dean of the medical school.

Sir Norman Moore, in his biography of Bell in the *Dictionary of National Biography*, writes: "Bell's discoveries were the greatest which had been made in physiology since Harvey demonstrated the circulation of the blood, and Bell was only expressing a just idea of their importance when he wrote of them in a letter (November, 1821) to his brother," George Joseph Bell, a distinguished Scottish lawyer, "'they will hereafter put me beside Harvey.'" The preface to the *Letters of Sir Charles Bell*, published in 1870 by the care of his widow, is described by Sir Norman Moore as admirable; it was written by the Rev. Whitwell Elwin at the request of Lady Bell, and Mr. Webb-Johnson quotes the following passage from it as containing a just appreciation of the man: "To the genius of a great philosopher Sir Charles Bell united the qualities of a noble-minded man. His rare originality, his profound knowledge, his varied accomplishments, his unremitting industry, did not save him from long and anxious struggles, and he neither abated the cheerfulness which was habitual to him nor surrendered one jot of his independence. The many in every generation who are exposed to the same, or similar difficulties, will find comfort and courage in his high aims, inflexible principles, and calm perseverance. He had far too just an estimate of the littleness of man in the midst of the vastness of creation to give way to conceit, and too profound a faith in the Providence Who governed the world to be otherwise than deeply thankful for his lot. Vanity and discontent would have seemed to him falsehood, and none the less because he had extorted a magnificent secret from Nature, and given it to science."



Mr. Webb-Johnson suggests that the reason why the school possesses no portrait of Bell is to be found in the following statement which also appears in the *Letters*: "There never was a really good portrait of Charles Bell. It seemed impossible to fix on canvas the varying expression which was one of his great charms. He could scarcely be called handsome, but his noble brow, his benevolent, playful smile, and a certain gracefulness in the carriage of his head, and in all his movements, were very attractive. No one could see him without feeling he was no ordinary man."

The oil portrait now presented to the Middlesex Hospital Medical School is by Mr. Dorofield Hardy, who has found his inspiration at the bust in the Royal College of Surgeons of England and the engraving in Pettigrew's Medical Portraits. The engraving shows Bell in Court dress, and by a fortunate chance the exact details are given in a letter from Lady Bell to Miss Bell dated October 12th, 1831: "I have had a busy forenoon dressing our Knight of the Guelph. I assure you he looks very grand, like Sir Charles Grandison, in his Court dress—dark-brown and cut steel, white satin waistcoat, chapeau, sword, buckles, point d'Alençon frills, and cuffs, and his Order with the Blue Ribbon."

Bell's fundamental experiment was thus recorded by him in the book he published in 1811 entitled *A New Idea of the Anatomy of the Brain*: "On laying bare the roots of the spinal nerves in an animal recently killed, I found that I could cut across the posterior fasciculus of nerves which took its origin from the posterior portion of the spinal marrow without convulsing the muscles of the back, but that, on touching the anterior fasciculus with the point of the knife, the muscles of the back were immediately convulsed.... I now saw the meaning of the double connexion of the nerves with the spinal marrow." In 1822 Magendie showed that irritation of the posterior roots caused pain. Sir Charles Sherrington has said of the Bell-Magendie experiments that their importance can hardly be overstated; they showed that the incoming channel was in one spinal root and the outgoing in the other. But there can be no doubt that Bell had the priority. It seems clear that Bell eventually got a preliminary idea of reflex action. In a letter dated January 9th, 1826, he wrote of his discovery: "It shows that two nerves are necessary to a muscle, one to excite action, the other to convey the sense of that action, and that the impression runs only in one direction, *e.g.*, the nerve that carries the will outward can receive no impression from without; the nerve that conveys inward a sense of the condition of the muscle cannot convey outward; that there must be a circle established betwixt the brain and a muscle." He established the fact that the spinal nerves have filaments of both kinds, sensory and motor, but that their anterior roots, springing from the spinal cord, are always motor and posterior roots sensory. He demonstrated also (1829) that the fifth cranial nerve is a motor as well as a sensory nerve, and that the motor nerve of the muscles of the face is the portio dura of the seventh nerve.

Bell was born in 1774; he died of angina pectoris at Hallow Park, near Worcester, on April 28th, 1842. There is a tablet to his memory in the church.

British Medical Journal.

SATURDAY, JULY 28TH, 1923.

ENVIRONMENT AND HEALTH.

THE President's dual position in Portsmouth, as senior surgeon to its hospital and chairman of its Health and Housing Committee, specially fitted him to speak to the members of the Association assembled in the fine Town Hall on the subject of environment and health. His address is published in full in this issue (p. 135).

Environment was the watchword or the battle cry of the early sanitarians—the men who worked at reducing death rates by application of the principle that cleanliness is next to godliness, and who, as recorded by that father of the modern science of statistics, Dr. William Farr, achieved a large measure of success, so that the babies born in the course of any one year at the time he wrote had distributed among them the gift of two million years of life more than had fallen to the lot of the babies in previous generations. The two millions was the dividend, in a currency far more precious than money, on the expenditure involved in the work of the health pioneers. Since Farr's day the dividend has been immensely increased, so that now, if we mistake not, it averages about ten years' additional life for each child born in this country.

But in modern times the science of bacteriology has extended the boundaries of preventive medicine, so that attention has been largely directed to the discoveries of the laboratories, and perhaps, looking to the limitations of the human mind, in some degree diverted from the field work of men like Southwood Smith, Simon, and Buchanan in England, and Gairdner and Russell in Scotland. The President, therefore, has done well to bring back attention to the broad influence of environment. Realizing that the public, lay and medical, is already alive to the importance of preventing acute epidemic diseases, he wisely, after taking appreciative note of the work of Jenner and Pasteur, and of the value of vaccine prophylaxis, vaccine therapy, and antiserum prophylaxis and therapy, goes on to bring into prominence the tremendous influence of bad environment in maintaining and fostering endemic disease. The special environmental factors on which he concentrates attention are those influencing the slum areas of great industrial centres—on the one hand lack of fresh air and sunlight, on the other overcrowding with all its attendant evils. He inquires into the influence of these on four of what he calls the five endemic scourges of the present day—cancer, tuberculosis, rickets, venereal disease, and alcoholism — but he makes only brief reference to cancer because, as he regretfully confesses, we know so little about it; he urges as a point of honour that the profession shall not rest content until the problem of malignant disease has been solved, and he holds that our knowledge of the crucial fact that its beginnings are local has not been so productive as might have been hoped.

The inclusion of alcoholism as a scourge to be preventively dealt with on environmental lines is striking, and is profoundly wise as well as striking. There is, of course, the moral question as well as the physical; alcoholism is both a vice and a disease, but who shall attempt to draw the line? Appreciation of the difference between a drunken and a sober nation led the last Czar of Russia to perform the one outstandingly strong act of his otherwise tragically weak career, when he prohibited the manufacture of vodka at the beginning of the world war. The Federal Government of the United States is in its own fashion tackling the same problem, and, however open to criticism its method may be, the nobility of its object should protect it from the sneers and jeers of interested or self-interested spectators in other countries. But Mr. Childe's method is essentially different from that of America, and, though the two methods are not mutually exclusive, most thinking people will prefer the preventive to the prohibitive plan, the creation of surroundings and interests which will tend to strengthen the character of the population rather than forcibly to debar it from continuance in a habit which has become part of daily life. Yet the endeavour of America to cure a great evil by absolute compulsion will be watched with interest on this side of the Atlantic.

The President would rather have healthy dwellings to prevent tuberculosis than sanatoriums in which to treat it. This policy was urged by Professor Wynne last year at Glasgow, and is consistent with that advocated by the late Dr. Timbrell Bulstrode in one of the most valuable reports ever issued by the old Local Government Board. It appeared at a time when the infectionists were beginning to have it all their own way under the influence of a somewhat misleading analogy between tuberculosis and the more acute infectious diseases. But sanatoriums are and will for many a long year be required as well as healthy dwellings, and we must continue to deal with end-products as well as with their causes. Mr. Childe fully realizes this — he directed the special attention of his audience to the work being done by Sir Henry Gauvain at Alton and Hayling Island, "where the cures are fresh air and sunlight." The President's insistence on the value of sunlight implies abolition of coal smoke. The part played by the smoke of coal fires, both domestic and industrial, in the exclusion of sunlight from cities is serious; possibilities of improvement exist in the substitution for coal fires of gas fires or other clean methods of producing heat for home or factory. A general reform would be very costly, but abolition of the smoke nuisance would make a radical improvement even in a densely populated city. As regards rickets the President takes the same sound line. The rival theories of its causation harmonize in their application to its prevention. The children want vitamins, but they also want fresh air and space and sunlight. Mr. Childe emphasizes by apt quotation from the reports of Dr. Chalmers of Glasgow the shockingly evil influence of overcrowding on venereal disease and on standards of morality. No one can challenge the strength of his argument.

What, then, is to be the remedy? More houses and better houses, of course. But how are they to be provided? Has private enterprise in house building and private investment of savings in house property for wage-earners been really killed, whether by the Budget of 1909 (or was it 1910?), or by Bolshevist teaching that every man should occupy rent-free any house to which he can find entry, or by the rapacity of all concerned in the building trade, or by doubts whether

Parliament, under vote-catching influences, can ever again be relied on to give reasonable protection to the house owner, or by these causes in combination and other causes besides? If so, if things have come to such a pass that houses for the industrial classes will no longer be built privately, then, indeed, provision for wage earners becomes a definite and permanent public responsibility, central, local, or both. It is a stupendous task, which it might never have been necessary to face but for foolish legislation. At the Annual Meeting in Glasgow last year Dr. F. E. Fremantle, M.P., discussed the economics of public health,[1] and urged that even financially its further advancement would be a profitable investment. He was fundamentally right, but in providing houses the State will have enormous difficulty in preventing the taxpayer and ratepayer from being fleeced as they were when Government took up the matter before. In our issue of August 26th last we wrote: "When, two or three years ago, the politicians and the press and the public outvied each other in their shoutings for houses, what was the result? The Government took up the matter, and with the enthusiastic support of builders and brickmakers and bricklayers entered on a course of reckless extravagance, which was brought to a stop when the nation came to realize that this was a post-war method of fleecing it, such as had hardly been surpassed by the great army of profiteers during the war itself. Straightway prices began to fall, and now houses can be built for a half, a third, or even a fourth of what the country had to pay for grandiose schemes which played into the hands of extortionists." A similar difficulty will certainly emerge in similar circumstances, and Government must be fully prepared to deal with it if, as it ought, it tackles the whole subject of housing on the lines suggested in the President's address. No more impressive argument for facing the situation boldly and speedily has been advanced than that which he brought before his medical audience, and through it, before the public.

THE GRADUATE'S DEBT.

SIR SAMUEL WILKS was fond of quoting Bacon's saying, "I hold every man a debtor to his profession; from the which as men of course do seek to receive countenance and profit, so ought they of duty to endeavour themselves by way of amends to be a help and ornament thereunto." Sir Harold Stiles, had he remembered it, or perhaps had he not had other quotations less hackneyed, might with a slight restriction have taken it for the text of his address as promotor of the new graduates at the summer graduation ceremony of the University of Edinburgh last week. The old custom in Edinburgh was that the graduate being capped—with a cap made, by a lively combination of sentiment and economy characteristic of the country, from the velvet breeches of George Buchanan, historian and poet—was promoted to the platform. Nowadays there are too many for this physical promotion; there were over 200 last week in medicine alone, and the promotor was content to impress on his audience in the body of the M'Ewan Hall the spiritual meaning of the promotion they had metaphorically enjoyed.

It was perhaps temerarious of the promotor in addressing newly capped graduates, whose brains would be fuller than their pockets, to make an appeal for money, but there is a sort of man who may steal a sheep and another sort who may not look over a gate. Doubtless Sir Harold Stiles belongs to the former sort, and doubtless, too, he had in his mind's eye a larger audience of Edinburgh medical graduates who have crossed the Tweed and sailed the seven seas to seek and find fortune. We have done our best to second his appeal by giving at page 159 a full account of what he had to say about the Alumni Associations of American universities. Barring the name, which is alliterative but not euphonious, they are organizations which deserve the compliment of imitation. American universities have been happy during the last two or three generations in winning the sympathy of rich men whose ambition it has been to found, not a family, but a place of study, a *studium generale*. But the notoriety of these immense benefactions has perhaps obscured what the graduates themselves do to strengthen the interest in learning and the strong sense of fellowship the universities foster.

The organization of graduates in America is twofold, and the one cuts across and supplies the deficiency of the other. There are the fraternities known usually, we believe always, by three letters of the Greek alphabet chosen apparently at random. Membership is not confined to any one university, but their portals are jealously guarded, and eligibility for admission would seem to depend primarily on the candidate's academic distinction. Their aim is mainly to promote good comradeship, and, as far as possible, to ensure to a travelling member in all the chief cities a sort of club where he may expect to meet men of his own kidney. They recall one side of the work of the mediaeval guilds, which made it possible for a wandering craftsman in a strange town to fall in with his fellows, to be comforted by them, and to learn from them. The other kind of organization, one more adapted to conditions in this country, is the Alumni Association. Of what such a body can do Sir Harold Stiles gave several examples. In an American university a great deal is made of graduation, or, as they perversely call it, commencement day. On that day all graduates of the university are welcomed by the officials of the university; here, except at Oxford and Cambridge, where collegiate life is strong and where a man can keep his name on the books of his college until the end of his days, the old graduate is like a fish out of water; the authorities know him not, neither do they care a pin about him, and it will be a pure chance if he runs across any man of his year. There are annual dinners of universities or medical schools, and the Scottish university graduates have dining clubs in several English centres, but they are unsatisfactory and ineffective substitutes for the American Alumni Associations, which have found many ways of preserving and stimulating the sense of corporate unity. The promotor suggested that a beginning might be made in Edinburgh with the medical alumni, and invited the General Council of the University to consider how the matter might be brought within the sphere of its activities.

Sir Harold Stiles had his sheep to steal, and we hope he may get clear away with it. The Simpson Memorial Hospital is a good intention ill fulfilled. That Edinburgh has no adequate maternity hospital in which its students can be taught preventive and operative midwifery is a reproach to the city, to the university, and, if we accept the doctrine of the Professor of Clinical Surgery, to its alumni also.

[1] BRITISH MEDICAL JOURNAL, 1922, vol. ii, p. 338.

ANNUAL MEETING NOTES.

THE REPRESENTATIVE MEETING.

THE main feature of the first day's debate in the Representative Body (reported fully in the SUPPLEMENT this week) was its simplicity and directness. There were no obscure issues; there was no close voting; and there was far less strong feeling than might perhaps have been expected. Two matters stand out in Friday's proceedings: of uncontroversial business, the election of Overseas Vice-Presidents and Dr. Gibbs's acknowledgement; of controversial business, the scheme for co-operation between the British Medical Association and the Society of Medical Officers of Health. The course of the latter discussion was a little surprising, in view of the very strong opposition to the proposals shown by a section of the Council throughout the whole course of the negotiations with the Society. The meeting was prepared for a full-dress debate, and so ready to applaud a good point on either side that the way the voting would go was at first in doubt; but the large majority of representatives seemed to have decided beforehand that the object of the scheme was sound, that the scheme itself would attain that object, and that the time had come to adopt it without more ado. The opponents of the proposed policy failed to show the meeting any valid reason for believing that it would not work; consequently their criticisms had little weight in influencing opinion, and there was almost a flavour of unreality about some of the objections to "the double vote." The Representative Body had evidently travelled a long way since this subject was debated at the Cambridge meeting, and personal or sectional animosity was refreshingly absent. Dr. Sanders, as a spokesman of public health officers, did nothing but good by his emphasis on the danger to the Association of a separatist policy, and of the advantages that would flow to it under the proposed scheme. Mr. Turner, in summing up the whole history of the policy, dealt in facts and not compliments when he attributed the successful evolution of the scheme to the statesmanship of the Chairman of Council. After the scheme had been accepted by a very large majority in a full house, the afternoon's work on the necessary modifications of Articles and By-laws was mainly formal. Notwithstanding an eleventh-hour effort to defeat the scheme by constitutional procedure, the proposals of the Organization Committee went through, subject to a happy amendment of the term "re-eligible" to "eligible for re-election." Two other matters may be noted here. The Kent proposals for altering the By-laws governing the composition of the Council gained little real support, but the ever-green question of providing individual medical defence was debated with considerable vigour. It may be doubted whether the Warrington motion would have been lost had any of its supporters been able to indicate any practicable method of working such a scheme. The general feeling seemed to be one of regret that the British Medical Association should not be in a position to meet every conceivable need of every one of its members, from the time of qualification to the time of retirement.

Business on Saturday was again dispatched with unlooked-for celerity, the Representative Body rising before 6.30 p.m. after dealing with the Hospitals, Journal, Science, Public Health, and Ethical Committees' reports, and some outstanding matters on that of the Organization Committee. The second day's session was mainly occupied in debating the Hospitals and Insurance Acts Reports; discussion on other matters was limited to isolated points, and was for the most part simple and direct. The speech of the Chairman (Mr. Souttar) in presenting the Science Committee's report deserves special mention, as it introduced matter not covered by the printed report—notably the large number and very high quality of this year's applicants for scholarships and grants, and the prospect of increasing activity in post-graduate education. Dr. Macdonald's presentation of the Journal Committee's report was received with great cordiality. The absence of any prolonged discussion on medical ethics was in conspicuous contrast with the record for the last three years. The Public Health report was practically confined to a list of subjects dealt with; but the discussions under this head on tuberculosis, summer-time, and vaccination, more especially the last, should prove of value to the public. The course of debate on the motion for representation of the Medical Women's Federation on the Council of the Association seemed to be determined largely by the way in which the motion was worded. Not even Dr. Hawthorne's admirable and highly appreciated argument from analogy could do away with the facts put forward by the proposer as calling for action. The introduction of the Hospitals report completely changed the atmosphere of the meeting. It was evident that here, at least, there was sharp disagreement both on principles and on procedure. For the first time in three years a position apparently consolidated has been withdrawn from. Three elements could be detected in the several amendments on the agenda paper—criticism of the Hospitals Committee for its conduct of this matter, fear of an irremediable split in the Association, and the objection (strongly felt by many influential consultants and others) to compromising what might be called the "high honorary" position by accepting any payment not hall-marked as an honorarium. At Glasgow the Hospitals Committee was instructed to find the best method of bringing together two apparently irreconcilable views. The Portsmouth meeting has decided by a small majority that the method suggested does not suffice, and the problem therefore remains for solution next year. A guess may be hazarded that the decisive factor in the decision ultimately taken this year was fear of disruption of the Association, which outweighed the fact clearly enough put before the meeting by Mr. Souttar and by the Chairman of Council, that opportunity waits on no man, and those who do not lead must expect to be forced to follow. The debate was remarkable more for the diversity than for the novelty of the arguments brought forward. For the rest, the Bolton and Barnstaple representatives, ably assisted by Dr. Hawthorne, gave the meeting an interesting essay in definition, but in so doing they failed to accept Dr. Brackenbury's challenge to define "free will" as a preliminary to defining the adjective "voluntary." This may have been why Mr. Harman's vindication of his own working definition was accepted. The afternoon's discussion on the report of the Insurance Acts Committee was conducted with far greater reserve, presumably because the pressure of external circumstances was in this instance more urgent. The debate on Document M.10 traversed delicate ground. The meeting showed itself unwilling to compromise the position of the Insurance Acts Committee by unnecessary criticism at this stage of the negotiations. In the discussion on the schedules defining the range of medical service under the Acts, it was interesting to note the emphasis laid on the position of the Insurance Acts Committee as working primarily in the interests of adequate service to the insured person. The debate left that Committee in at least as strong a position as it found it.

The morning session on Monday, July 23rd, was devoted to consideration of the finance report and the new home of the Association; the afternoon session to medico-political, parliamentary, and naval and military matters. Dr. Gordon Bell's attack on the financial statement was of service, if only as eliciting the independent defence offered by Dr. David Lawson and Dr. Peter Macdonald. Dr.

D'Ewart remarked that the weakness of criticism so emphatically offered might be taken as a very fair index of the strength of the position attacked. In any case, an attack founded in part on an alleged omission from the report of any estimate for the current financial year could hardly be effective. The criticism offered by Hastings, based only upon the increase in the volume of expenditure since 1920, lost its force in the atmosphere created by the earlier discussion, quite apart from the fact that, in avoiding the risks of concrete criticism, it suggested no practicable methods of effecting the desired economy. Dr. Rose's far stronger appeal for economy, based upon the burden of expense to the individual member, would have failed for the same reason, but the real reply to his contention was voiced by Dr. Peter Macdonald when he pointed out that to cut down expenditure as long as each additional outlay is producing an increasing return is economically unsound. The discussion on the relations between the Association and medical charities, introduced by Dr. Dearden, struck an unexpected note in criticism. The present position, as indicated by the Treasurer, is obviously unsatisfactory, and since it can only be remedied by action on the part of the governing bodies of the charities—that is, ultimately by pressure from subscribers—ventilation of the subject amongst these should prove of value. As regards the new building for the Association headquarters, the Chairman of Council and the Treasurer, reinforced by Dr. J. A. Macdonald and Mr. Bishop Harman, had a light task. If the representatives did not meet in a state of enthusiasm they came fully prepared to take fire, and the final vote of approval was given unanimously and with acclamation. The report of Dr. Bolam's lucid and persuasive speech should be read by every member. The medico-political report raised relatively little discussion; what debate there was arose on points of substance, and served a useful purpose, if only as indicating the thorough way in which the Committee had worked over the field covered by its report. The criticisms and inquiries offered were based on real difficulties. There was substantial agreement in regard to several amendments covering procedure in connexion with the report of offences to the General Medical Council by the Home Office. Many representatives clearly found the existing conditions objectionable in theory, but, as pointed out by Sir Jenner Verrall, the difficulty was to discriminate between cases to be reported and cases not to be reported, and consequently the meeting had no alternative but to leave things as they are. Even in the matter of midwives and the use of drugs, on which warm feeling was displayed, the ultimate decision left the Association's position unaltered. So, again, with the obligation of notification of births without remuneration. It was unfortunate that one motion of considerable interest, put forward by Dr. Noy Scott and Mr. Russell Coombe, was not on the agenda paper, and was adopted without attracting much attention. This was the resolution in favour of consultation between medical witnesses in the courts, especially in compensation cases, with a view to agreement on questions of fact prior to giving evidence for either party. The only point at which any acrimony was displayed was in connexion with the paragraphs of the Council's report dealing with the affairs of nurses. However, the meeting, directed to the real issue by Sir Jenner Verrall, refused to question the Committee's action.

Silver Ewer presented to Royal Naval Officers' Mess, Portsmouth.

GIFT TO NAVAL OFFICERS' MESS.

THE Exhibition at the Annual Meeting is being held this week in the Gymnasium of the Royal Naval Barracks, Portsmouth, which has never previously been open to any association or body other than the Royal Navy. To mark this unique occasion, and to show the appreciation of the assistance rendered to the Exhibition by the authorities at the Naval Barracks, it was decided to offer for the acceptance of the President of the Naval Officers' Mess at the Portsmouth Barracks a trophy which it is hoped will take its place amongst the beautiful collection of silver possessed by that Mess.

The piece selected is an ewer, a reproduction of one of a very fine pair of ewers (wine and water) designed by John Flaxman, R.A., working under the inspiration of an ewer now preserved in the museum at Naples. Flaxman was born at York in the year 1755 and died in 1826, and from an invoice still in existence from Flaxman to Wedgwood and Bentley, these ewers appear to have been designed and modelled in March, 1775, and are among the first articles produced by the artist for Josiah Wedgwood. The wine ewer is of classic design and feeling, as may be judged from the photograph here reproduced. A bold goat's head is mounted on the front of the body under the lip, with festoons of leaves and grapes on either side. The neck is ornamented with ripples of water; seated on it and forming the handle of the ewer is the figure of a satyr with his arms round the neck clasping the horns of the goat. The lower part of the body is ornamented with a mounted laurel band and leaves, and rests on a hollow-fluted and beaded foot, terminating in a low square plinth, decorated in panels with a form of key ornament.

The ewer, which is 16¼ inches in height and weighs 126 troy oz., was reproduced and manufactured by Mappin and Webb, Ltd. The ewer was presented to the President of the Naval Officers' Mess by Mr. Charles P. Childe when, as President-elect, he formally opened the Exhibition on Tuesday morning, July 24th (see SUPPLEMENT, p. 76).

THE BOOK OF PORTSMOUTH.

EVERY member of the Association, on registering his or her name this week at the reception room at the Municipal College at Portsmouth, has received a delightful little volume issued as a souvenir of the Annual Meeting by the Printing and Publishing Committee.[1] The *Book of Portsmouth* is not in any sense a guide-book to the town and

[1] *The Book of Portsmouth.* Portsmouth: Charpentier, Limited. 1923. (Cr. 8vo, pp. 191. illustrated.)

district; that need is supplied by the Corporation's official guide, of which also a copy has been presented to each member. In the words of its preface, the *Book of Portsmouth* "is simply a collection of historical facts, incidents, and impressions of the premier Naval Port of the Empire," put together for this occasion by a group of local experts under the editorial direction of Dr. William Carling. The volume covers a good deal of the ground already gone over by Dr. Carling in the interesting series of articles on Portsmouth which he has contributed during recent months to our columns. Mr. W. G. Gates, well known as a local historian, is responsible for the opening section, which consists of a number of short notes under the general heading "Portsmouth in the Past." He has written also a note on Portsmouth hospitals and physicians of the past, and the Committee records its gratitude to him for much general help in the preparation of the volume. Mr. Henry Rundle, F.R.C.S., gives an outline of the history of the Royal Portsmouth Hospital and other medical charities, while Surgeon Rear-Admiral W. Bett does a like service for the Royal Naval Hospital at Haslar. Dr. Charles F. Routh describes the charms of Southsea as a holiday and health resort. Dr. Mearns Fraser, Medical Officer of Health for Portsmouth, contributes an account of the municipal health services, and of the work of the Health and Housing Committees, whose chairman for the past four years has been Mr. C. P. Childe, President of this year's Annual Meeting. The illustrations to the interesting article on H.M.S. *Victory* include a sketch showing the famous flagship as she was in 1805, drawn by the eminent artist, Mr. W. L. Wyllie, R.A., who tells her story. The Mayor (Alderman F. G. Foster) outlines the admirable arrangements for higher and elementary education, in whose development he has had so large a share during his many years' chairmanship of the Portsmouth Higher Education Committee. Other short articles introduce the visitor to the Naval Dockyard, to the principal buildings of modern Portsmouth, to the sister town of Gosport, and to the remains of the famous old Roman fortress and Norman church at Portchester. Lastly, we may mention Dr. Carling's note on the neighbouring village of Hambledon (the cradle of English cricket) with its charming view of the old "Bat and Ball" Inn on Broadhalfpenny Down, once kept by Richard Nyren of cricketing fame. Indeed, the illustrations throughout the book are admirable, and reflect the greatest credit both on the Printing and Publishing Committee and on the publishers, Messrs. Charpentier, Ltd., to whose courtesy we were indebted for several of the pictures which have accompanied Dr. Carling's articles. There is no doubt that all who have enjoyed Portsmouth's hospitality this week will be glad to preserve the *Book of Portsmouth* as a memento of their visit.

Luncheon to Oversea Representatives.

A new and very welcome feature was introduced into the early part of the Annual Meeting this year. Before the Representative Body concluded its sessions the delegates from Oversea Branches were entertained to luncheon at the Corner House, Portsmouth, under the chairmanship of Dr. Wallace Henry, Chairman of Representative Meetings. Those present on Tuesday, July 24th, to welcome them on this informal occasion included the principal officers of the Association, the Chairmen of several Committees, and the chief officials. The guests represented widely scattered parts of the Empire—India, Australia, New Zealand, South Africa, West Indies, Malaya, Zanzibar, Sierra Leone, and Hong Kong. Their names are: Sir Joseph Verco (South Australia); Major-General Sir G. Godfray Giffard (South India and Madras); Dr. E. P. Baumann (Witwatersrand); Dr. B. Spearman (Zanzibar); Dr. W. Owen-Pritchard (Tanganyika); Dr. Beringer (Sierra Leone); Dr. G. W. Bampfylde Daniell (Cape of Good Hope, Western); Dr. John Hutson (Barbados); Dr. J. A. E. Glennie (Singapore); Dr. A. C. Lankester (Hyderabad and Central Provinces); Dr. J. V. Manning (Orange Free State); Dr. H. E. Gibbs (Wellington, N.Z.); Dr. E. C. Dean (Perth, Western Australia); Dr. O. Marriott (Hong Kong); Dr. G. B. Mason (Grenada); Lieut.-Colonel Ashton Street (Bombay). The speeches were short, friendly, and to the point. After the loyal toast had been honoured the Chairman proposed the health of the Dominion visitors, mentioning his gratification at the increasing activities of the Oversea Branches of the British Medical Association, of which an index was the growing volume of reports received at headquarters and the larger number of visitors coming each year to attend the Annual Meetings in the mother country. The toast was supported by the Chairman of Council, the Chairman of the Organization Committee, the Solicitor of the Association, and the President-elect, and each in his own way offered a warm welcome to the representative members from overseas. Dr. Bolam told of the Council's constant desire to maintain imperial unity in the medical profession. Dr. Morton Mackenzie, on behalf of the Organization Committee, whose work brings it into constant communication with Oversea Branches, welcomed this informal opportunity for personal intercourse between the representatives from abroad and the officers and officials at home. Mr. Hempson acknowledged the great courtesy and hospitality shown to him during his tour of the Dominions. Mr. Childe, as one who was born and went to school in South Africa, expressed his pleasure at meeting the guests and his desire to do everything in his power to strengthen the bonds between the Association at home and the Association overseas. The toast was responded to in very cordial terms by Dr. J. V. Manning and by Sir Godfray Giffard, who remarked that the work of the Representative Meeting had shown him that the profession at home and the profession in the East were wrestling with very much the same medico-political problems. Dr. Baumann, in proposing the Chairman's health, expressed his warm appreciation of the reception given to him and his colleagues by the Representative Body during the past four days, and in particular by their hosts on this occasion. Dr. Wallace Henry's brief acknowledgement brought a very pleasant and profitable meeting to a close.

A Sea Trip to Southampton.

On Sunday, July 22nd, when the Representative Body rested from its labours of the two previous days, a large party of representatives and ladies accompanying them made a most enjoyable trip by sea to Southampton. The party left the Clarence Pier, Southsea, on the steamer *Duchess of Fife* at 10 o'clock, in delightful weather. Making its way past the island forts of Spithead and the anchored aircraft carrier H.M.S. *Argus*, the boat steamed towards Ryde and then passed along the wooded shores of the Isle of Wight to Cowes Harbour, before turning into Southampton Water. Bright sunshine and a cool breeze, and glimpses of the white sails of racing yachts in the Solent, contributed to the pleasure of the voyage. As Southampton was approached, and the long façade of Netley Hospital came into view, the vast funnels of ocean-going liners could be seen towering above the quays and dwarfing the cargo boats moored in the estuary. Disembarking at the Havre Dock, a visit was paid to the cross-channel packet-boat *Normannia*, after which the party was entertained to luncheon at the South-Western Hotel by their hosts for the day, the Southampton Division of the British Medical Association. The visitors then walked to the White Star liner *Majestic*, which was lying at her berth beside one of the longer quays, and every part of this luxurious great ship was inspected by kind permission of the directors of the White Star Line. All the

arrangements for the comfort and safety of passengers and crew were much admired; special interest was shown in the medical equipment, the swimming bath, and the apparatus for enabling passengers to take active exercise during an ocean voyage. After this tour of one of the largest liners afloat, the party made their way back to the little *Duchess of Fife*, and found tea ready to be served on board during the return journey. Southsea was reached in time for dinner, and it was generally agreed that a delightful day had been spent.

THE INTERNATIONAL SURGICAL CONGRESS.

THE meeting of the International Surgical Congress in London, the early proceedings of which were reported last week (p. 121) came to an end on Friday, July 20th. We publish this week reports of two more of the discussions—one on arthroplasty, which was well sustained and excited a great deal of interest, and the other on injuries to the peripheral nerves. The meeting, under the presidency of Sir William Macewen, was in every way a great success. A general meeting of the Society, very largely attended, was held, with the President in the chair, on July 19th, when it was decided that the next congress should be held in Rome, and not in Warsaw as had been proposed. Dr. Davide Giordano of Venice, was elected president. Votes of thanks to Sir William Macewen for his services as president, to Dr. Leopold Mayer of Brussels, general secretary of the Society, and to Sir D'Arcy Power and Mr. J. E. H. Roberts, the two British secretaries of the meeting, were proposed by Dr. W. W. Keen of Philadelphia, who expressed the feeling, shared by the whole Congress, of deep indebtedness to the secretaries for the able and particularly thorough way in which all arrangements for the convenience and comfort of the delegates and members had been made. A banquet was held on Friday evening, July 20th. Sir William Macewen, who was in the chair, proposed the health of the delegates, and expressed the pleasure he and his British colleagues felt in meeting so many representatives from different countries. The Society had received two invitations for the next Congress—one was from Poland. It was, Sir William Macewen said, a plucky thing for our Polish friends to do, and it showed that they had great faith in themselves; he hoped that if the invitation were repeated at some future date the Society might be able to meet in Warsaw. The next Congress, it was arranged, should be held in Rome, the capital of a country vibrant with scientific life. The toast was acknowledged by the spokesmen of several countries. Dr. R. A. Alessandri, Professor of Clinical Surgery in Rome, said that medicine was the only world-wide art, and that its universality was its most important attribute. In the modern Greece, as Osler had called England, the foreign members had received, and were most grateful for, abounding hospitality. Dr. Mayer, responding for France and Belgium, also expressed the gratitude of the foreign members and the hope that the *entente cordiale* of medicine might continue. Dr. Koch, who spoke for Holland, recalled the time when an English king was Stadtholder of Holland, and said that the Dutch would never forget the help given them by England in the time of Elizabeth, when their country was oppressed by Spain. Dr. Crile returned thanks for the United States of America, Dr. Hansen for Denmark, Dr. Petridis for Egypt, Dr. de Zawadski for Poland, Dr. Kayser for Sweden, and Dr. de Quervain for Switzerland. In response to loud calls Sir D'Arcy Power and Mr. J. E. H. Roberts, the British secretaries, briefly and very modestly returned thanks. Mr. Roberts observed that Sir D'Arcy Power had been for twenty-two years and until last year British representative. A number of receptions, besides those mentioned elsewhere, were given during the meeting of the Congress; on July 17th the members were received by Sir Charles and Lady Ballance, and on the following evening by the Lord Mayor and Lady Mayoress at the Mansion House.

MEDICAL RESEARCH IN INDIA.

THE committee on retrenchment in India, over which Lord Inchcape presided, recommended, among other things, that the payment of research officers from central revenue should cease, and that the grant-in-aid to the Research Fund Association should be discontinued. The association had accumulated 33 lakhs, derived from the Government contribution and earmarked for a new central institute at Delhi; the committee advised that the interest on this sum should be used for the maintenance of medical research. The *Pioneer*, which is commonly credited with being well informed as to the intentions of the Government of India, stated in its issue of June 7th that it was understood that the Inchcape Committee's recommendations regarding the continuance of expenditure on medical research will not be accepted in their entirety. The adoption of the drastic proposals put forward by Lord Inchcape and his colleagues would, our contemporary continues, have involved "the virtual closing down of all research work in India, for, in the face of such a curtailment of activity, the chances of obtaining research workers in the future would have been small indeed. As it is, there is ground for the belief that the policy to be adopted will be that of securing a state of suspended animation. Thus instead of abolishing the appointments of twelve bacteriological officers, as recommended by the Retrenchment Committee, it is proposed to leave six of these appointments unfilled until financial conditions are more favourable. The establishment of a central research institute at Delhi and the grant of five lakhs a year to the Indian Research Fund Association are similarly suspended. This measure of retrenchment will be regretted, but it, at least, will not render the position hopeless, and it provides the retention of a nucleus for expansion when the occasion is suitable. The Directorship of Medical Research has been abolished for the time being, but arrangements are being made for that officer's duties to be carried on departmentally." The *Pioneer* goes on to express the opinion that if its prognostications prove to be correct, the Government of India has been able "successfully to temper its obsession on the subject of retrenchment with a due appreciation of the vital importance of medical research in a country like India." We can only express a fervent hope that this interpretation of the situation may prove to be correct; it does not seem to be a particularly courageous manner of dealing with a matter of so much importance. As we observed when the Inchcape report was first published, it is a paltry piece of economy to cut down the relatively small sum provided for the scientific study of the causes which lead to the high mortality among the 350 millions of the population of India. The amount represents an expenditure of about one-twelfth of a farthing a head a year. The wisdom and policy of establishing a central medical research institute at Delhi is, we admit, open to doubt; it may be very much wiser to subsidize provincial institutes and special inquiries. It is easier to destroy than to build up, and even if a nucleus be retained the loss of experienced workers can hardly fail to make the eventual expansion more difficult.

THE BRITISH ASSOCIATION.

THE arrangements for the meeting in Liverpool of the British Association for the Advancement of Science are now far advanced. This will be its fifth meeting in Liverpool; the last occasion was in 1896, when Lord Lister was president. The president this year is Sir Ernest Rutherford, who in

his presidential address, to be delivered on the evening of September 12th, will deal with the electrical structure of matter, a subject in which he is a pioneer. Lectures will be given by Professor Elliot Smith on the study of man and by Mr. Julian S. Huxley on the physiology of development in the frog, and we learn from an article in *Nature* that citizens' lectures will be given both in Liverpool and in some of the neighbouring boroughs. It is also intended to repeat the experiment of giving a few lectures to young people, which proved so successful at last year's meeting at Hull. There will be thirteen sections. In the section of physiology Professor G. H. F. Nuttall's presidential address will deal with symbiosis in animals and plants. Dr. J. C. Burt will give an address as president of the section of psychology on the mental differences between individuals, with special reference to individual psychology in education and industry. The presidential address in the section of anthropology, by Professor P. E. Newberry, will deal with Egypt as a field for anthropological research. During the whole of the meeting an exhibition of scientific apparatus, specimens, diagrams, and so on, representative of the work of all the thirteen sections, will be on view in the Central Technical School. Judging from the success of the small sectional exhibitions arranged on several occasions during the last decade it is anticipated that this collective exhibition will prove of interest to all members. On the last evening of the meeting—Tuesday, September 18th—a scientific soirée will be held at the University on the lines made familiar by the Royal Society. A number of experiments illustrating recent developments in science will be shown and a series of short addresses will be given.

DIRECTOR OF MEDICAL SERVICES, INDIA.

COLONEL CHARLES HARFORD BOWLE-EVANS, C.M.G., C.B.E., M.C., Indian Medical Service, has been appointed Director of Medical Services of the Army in India, in succession to Lieutenant-General Sir Charles H. Burtchaell, K.C.B., whose term of office is about to expire. This is the first occasion on which an officer of the Indian Medical Service has been appointed D.M.S. India, with the exception of the short period, about three months, for which the appointment was held by the late Sir Pardey Lukis during the war. Colonel Bowle-Evans received his medical education at Cambridge and St. Bartholomew's Hospital, and graduated M.B., Ch.B.Camb. in 1894. He entered the Indian Medical Service in 1895, was promoted major in 1905, lieutenant-colonel in 1913, and colonel in 1921. He served in Waziristan 1894-95 (medal and clasp), Chitral 1895 (medal with clasp), North-West Frontier 1897-98 (clasp), and China 1920 (medal). For his services in the European war (1914-15) he received the C.M.G. He is at present A.D.M.S. Poona District.

MEDICAL DIRECTOR-GENERAL, R.N.

SURGEON REAR-ADMIRAL JOSEPH CHAMBERS, C.B., C.M.G., will on October 1st succeed Surgeon Vice-Admiral Sir Robert Hill, K.C.B., K.C.M.G., as Director-General of the Medical Department of the Navy. Sir Robert Hill has had a very distinguished career. He joined the navy in 1890, and during the war was principal medical officer of the Grand Fleet. He was thanked and promoted for his services at the battle of Jutland, where the Commander-in-chief stated that his excellent organization contributed much to the well-being of the wounded. He received the K.C.M.G. in 1919, in which year he was appointed Director-General; he received the C.B. in 1918, and was promoted K.C.B. in 1922. The new Director-General has recently been in chief medical charge of the Royal Hospital, Plymouth. He was a student of Trinity College, Dublin, where he graduated M.B., B.Ch. in 1887, and was promoted to be Surgeon Rear-Admiral three years ago.

THE THOUSANDTH SUPPLEMENT.

THE SUPPLEMENT of this week is the thousandth number. The propriety of issuing a Supplement had been under consideration for some time before the first number appeared on February 7th, 1903. In October, 1901, the Council adopted a recommendation of the Journal and Finance Committee to the effect that in view of the amount of official matter which had to be published in the JOURNAL it was desirable to issue from time to time Supplements containing such material. The recommendation was not immediately acted upon, because it was a time of transition, and it was thought well to wait until the new constitution was in full working order. At first the SUPPLEMENT was issued at irregular intervals as matter accumulated, but since the beginning of 1905 it has appeared with very few exceptions every week. It varies in size according to the exigencies of the moment; on several occasions it has contained 64 pages, either when the Annual Report of the Council was published or when there has been a special Representative Meeting. During the current year it has contained on several occasions over 40 pages, and that for this week, in which the first three days of the proceedings of the Representative Meeting at Portsmouth are reported, contains 44 pages. In addition, special SUPPLEMENTS have occasionally been published, as, for instance, the report on contract practice, containing 96 pages, published on July 22nd, 1905; on January 6th, 1912, the text of the Insurance Act, 1911, was issued, and occupied 64 pages, in addition to an ordinary SUPPLEMENT of 24 pages. The growth of this department of the JOURNAL can be measured by the fact that in 1903 the fourteen SUPPLEMENTS, including index, filled 246 pages, while in 1912 the two volumes contained 1,484 pages. During the war the bulk of the SUPPLEMENT was very much diminished, but it has grown again until last year (1922) the two volumes contained 492 pages. The object with which the SUPPLEMENT was established was that members of the Association should be able to follow every phase of its work, and to appreciate its variety and extent. In this way it was believed, and the expectation has been realized, that a larger proportion of members would be stimulated to take a wider interest in the Association's efforts for the furtherance of reforms within as well as without the profession.

THE National Alliance for the Increase of the French Population has awarded the first prize of fr. 50,000 to M. Paul Haury for the best popular pamphlet on the decreasing birth rate in France and the tragic consequences to the nation.

THE second Rumanian Congress of Oto-rhino-laryngology will be held at Bucharest on October 27th and 28th, when the following subjects will be discussed: Radiotherapy and radium therapy in oto-rhino-laryngology, introduced by Professor Metianu; otitis media in infancy, introduced by Drs. David and Predescu-Rion; vaccine treatment of ozaena, introduced by Drs. Tempea and Vasiliv. The titles of papers should be sent to the general secretary, Dr. Mayersohn, 97, Calea Mosilor, Bucharest, before October 1st.

THE Academy of Sciences of Cuba offers the Dr. Suárez Bruno prize, consisting of a diploma and 300 pesos, for the best work on anaemias of parasitic origin; the Cañongo prize of 250 pesos for the best work on an unspecified subject; and the Gordon prize of a gold medal for the best work on the respiratory functions and the circulation in Cubans. The competing papers, written in Spanish, English, or French, must be sent anonymously, with the author's name in an accompanying sealed envelope, and must be received before March 30th, 1924.

IMPERIAL CANCER RESEARCH FUND.

As mentioned briefly last week, the annual meeting of the Imperial Cancer Research Fund was held on July 17th, when the usual business was transacted. We have already quoted the observations of the President, the Duke of Bedford, with regard to the relation of the Fund to the British Empire Cancer Campaign.

Lord Atholstan's grant to the Fund for research has been utilized by the appointment of Dr. A. M. Begg to carry out an investigation on the subject of the infective sarcomata (dogs and fowls) with a view to defining the difference, if any, between them and true neoplasms. Last March an anonymous donor founded an "Alice Memorial Fellowship" for cancer research under the auspices of the Fund, and recently Dr. Marshall Findlay has been appointed to be the first Fellow. The question of clinical research in cancer has been under consideration, and last December the directors of the surgical units in London were asked to discuss with a subcommittee the possible lines of such an investigation. Various proposals were considered, including an investigation into deep x-ray radiation, but further proceedings were postponed on account of the proposal to institute the Cancer Campaign. The director, Dr. J. A. Murray, presented his annual report:

REPORT OF DIRECTOR.

Vitamins.

The investigations mentioned in the preceding Annual Report have been continued. Dr. Cramer's work on vitamin deficiency has been brought to a conclusion, so far as regards cancer, and will be treated as a whole in a paper in the forthcoming eighth Scientific Report, which it is hoped to issue in the autumn. Briefly, it can be said that repeated experiments, under the most stringent conditions, have failed to give any evidence of an inhibitory effect on the growth of cancer, even when the deficiency is so severe as to be incompatible with life. This apparently paradoxical result has been obtained with deficiency of both the water-soluble and fat-soluble vitamins separately and in combination. No experiments have been performed to test the effects of deficiency of the antiscorbutic vitamin C, as it was felt that this deficiency is too dangerous to life in man to permit of even a tentative application to the treatment of cancer in human beings. While a practical value in treatment is not to be expected in this direction, the results of these experiments cannot fail to have a considerable influence on our conceptions of the way in which vitamins act.

Effect of Radiation.

The curious fact that the absence of vitamins from the diet produces atrophic lesions very similar to those produced by exposure to radiations from *x* rays and radium led to an investigation into the biological effect of radiations on the normal organism. In this investigation Dr. Mottram, of the Radium Institute, has collaborated with the workers of this Fund. It was found that exposure to radium has a profound effect on intestinal activities and that large doses may lead to severe lesions in the intestine. There is also an effect on the blood platelets which, if it is allowed to continue unchecked, is constantly associated with an incurable anaemia of the pernicious type. These observations on the effects of large doses of radiation are of importance in connexion with the therapeutic applications of radium and *x* rays. Small doses of radiation often lead to obesity. The manner in which this condition is produced has also been studied, and shown to be related to the testicular atrophy and hypertrophy of the interstitial cells.

Tissue Culture.

Dr. Drew's tissue-culture work has been carried on energetically, and has added considerably to our knowledge both of normal and cancerous cell life. The phenomena of differentiation and loss of differentiation, as they appear in tissue cultures, have been reduced to an orderly sequence, and can now be reproduced at will. He has shown that differentiation is absent in cultures of normal tissues (kidney, skin) when the essential parenchyma cells are grown in pure culture without admixture of connective tissue. The addition of a pure culture of connective tissue to such a pure culture of kidney epithelium or squamous epithelium is quickly followed by typical histological differentiation—the kidney producing convoluted tubules with swollen bulb-like extremities, and the squamous epithelium keratinizing out in cell nests. It is practically impossible to maintain the exact balance between the two factors under the experimental conditions, as usually the connective tissue overgrows and suppresses the epithelial elements. Occasionally the epithelium obtains the upper hand, and it then grows as before, as an undifferentiated sheet of cells. The sequence of forms presented by squamous epithelium in this series of experiments corresponds with the aberrant differentiations met with in squamous-cell carcinomata, and leaves no doubt that in this lies the explanation of the extraordinary range of cell forms, well known from human pathology and in the tar carcinomata of animals, which have been the subject of inconclusive controversy in the past.

Analogous experiments with undifferentiated mammary carcinoma of the mouse (alveolar carcinoma) have shown that here also complete loss of differentiation is not necessarily an irreversible process—an anaplasia in v. Hansemann's sense. When grown with an abundance of active connective tissue the large alveolar masses of polygonal cells become broken up into small trabeculae in which a minute lumen appears. A typical loose adenomatous structure, closely resembling developing mamma, results. The undifferentiated condition returns when the connective tissue is removed or suppressed by overgrowth of the carcinoma. From both series of experiments Drew concludes that the loss of differentiation, which has played so large a part in the theoretical discussion on cancer, is merely a superficial peculiarity of cancer cells when it occurs. Even when exhibited in its most superlative degree, it may be replaced by wonderfully perfect differentiation, without in any way affecting the essential malignancy of the cells, as evidenced by their behaviour on further culture or on inoculation into susceptible animals.

A Hypothesis of Growth-activating Substances.

Another series of experiments has enabled Dr. Drew to gain an insight into the mechanism of repair and possibly the essential nature of the malignant transformation. It has been known for a long time that, while embryonic tissues and tumours grow with ease and without delay when placed in a suitable culture medium, adult tissues, even from young animals, only begin to proliferate after a considerable lapse of time. With adult kidney or heart of the rat this delay may extend to fourteen days. If, however, an extract of adult minced kidney, which has been incubated along with the fluid used for extraction for one or two hours, be added to the culture medium, growth commences at once in every case. If the extract of minced kidney be made with ice-cold saline without incubation, the initial delay in growth is as long as in the cultures made without it. When a similar ice-cold extract is made from a rapidly growing transplantable tumour, growth of adult tissue is elicited as energetically and with as little delay as when the incubated extract of minced kidney is used. At first sight this might be regarded as merely a consequence of the frequency of cell death and autolysis in new growths, but there is another possibility which should be borne in mind. It is that malignant cells produce, automatically and continuously, growth-activating substances, which normal tissues only elaborate in response to injury. The strength of the extract is directly proportional to the rate of growth of the tumour in the strains which have been investigated and not to the degree of necrosis. I incline to the opinion that the mode of production of these activating substances is an essential part of the difference between normal and cancerous cells.

This conception helps to rationalize the part played by chronic irritation in cancrogenesis. The specific irritants which are known to lead to the development of cancer are relatively mild, and do not cause rapid destruction. Rather, they may be imagined to set up a slight degree of protoplasmic disintegration still compatible with continued life of the cell. The curious sudden change after a long period of irritation, which marks the beginning of autonomous growth, would on this hypothesis correspond to a change in the protoplasm by which the production of activating substance turns from its purely induced reactive character to a self-acting process, as the result of a sort of education of the cells. Deelman has shown that this preparatory stage can be shortened by combining trauma (by scarification) with the application of the much more slowly acting tar products, and there can be little doubt in the light of Drew's experiments that such scarification produces activating substances in the damaged epithelium.

Tar Carcinoma and Sarcoma.

My own experiments on the production of tar carcinoma have mainly been directed to overcome the refractoriness to cancer production—to which attention has already been drawn—encountered when animals which have already reacted with cancerous growth to tarring, or which have developed spontaneous mammary carcinoma, are painted with tar on an apparently healthy skin surface. A provisional account of this work will be presented to the cancer congress to be held in Strasbourg. So far tar carcinoma has not been produced in either group, and the conclusion is drawn that a generalized insusceptibility to the induction of primary cancer is present in animals which have once developed a malignant new growth. It is to be noted that

the disability only refers to a second induction of cancer, for these refractory animals may present recurrence or actively growing metastasis of the original primary tumour. Evidence has been obtained that the refractory state may set in early in the preparatory period before the first primary growth has started.

Dr. Russell has obtained a second tar sarcoma in a rat, in the series which has already given one as described in his paper on the subject published last year. It arose after an interval of six months from the last tar injection and eighteen months after the beginning of the experiment. He has continued his investigations on the utilization of carbohydrates by surviving tumour cells, extending them to a study of the pentoses. Some of these are apparently more easily attacked by cancer cells than by normal tissues. The indications afforded by these experiments will be the basis of chemotherapeutic experiments, in which he will have the collaboration of Mr. H. G. Crabtree, M.Sc., who has joined the scientific staff for this purpose.

Medical Notes in Parliament.

[FROM OUR PARLIAMENTARY CORRESPONDENT.]

Restriction of Sale of Alcohol to Young Persons.

IN the House of Lords, on July 19th, Lord Dawson of Penn spoke on the second reading of the bill (already through the Commons) for restricting the sale of alcohol as regards persons under 18. While supporting the measure he said he should have been more happy if he had heard one word of grudging approval of alcohol for any people of any class whatever. Quite a large proportion of those supporting the bill looked upon alcohol as harmful in itself, and therefore specially harmful for youths and adolescents. Facing the question what was the effect of alcohol, alcohol was, without doubt, a food, but that it was a good and effective food in health no sensible persons would contend whatever it might be in sickness. It was a stimulant, though only for a transient period, and anybody who referred to it as a narcotic was a scientific philistine. In excess it might be a narcotic, but in moderation it added to the pleasure, the exhilaration, the happiness, and the gaiety of life. At the end of a day the mind of a man who worked hard got into one track. Alcohol got him out of it, enabling him to travel from one topic to another. He took for example a working man who had been assisting in the manufacture of a motor car, utilizing the same muscles for six, seven, or eight hours. That meant that he had been utilizing precisely the same cells of his brain for those hours. At the end of the day the brain was in one track and the outlook grey. Lord Dawson suggested that here the moderate use of alcohol came in. Good beer at that particular time of the day would help and not harm. He happened to be at a public dinner not long ago when the centre table consisted almost entirely of prohibitionists, among them several high enthusiasts. It was the one dull grey spot in the whole of that dinner. Then as to digestion. A number of people at the end of a fatiguing day were unable to digest food because their nervous system was too tired. A small quantity of alcohol made them happy with themselves and with the world. In the particular phase of civilization through which we were passing alcohol, properly taken and in moderation, could serve a useful purpose. The great distinction between youth and age, however, was that whereas the first effect of alcohol was to exhilarate and uplift and to help, the second effect—namely, the narcotic—followed in youth very much more quickly than it did in adult years. The argument for this bill was that youth did not require alcohol. If it got into one track it got out of it quickly, sometimes too quickly. In taking alcoholic beverages much depended on quality and strength. Chemical analysis might disclose no difference, for the qualities of good wine and beer were due to traces of substances which might be compared to vitamins in food. The good effect of alcohol, however, depended entirely upon moderation. He thought it would be admitted that the community at large was showing an increasing moderation in the consumption of alcohol. To appreciate this it was only necessary to watch the returns of the magistrate's court, but he had got out the figures of a large hospital in London for ten years and had chosen two diseases produced by alcohol. In the year 1900 there were 39 cases of cirrhosis of the liver admitted into that hospital; in 1920 there were 7. He then selected an alcohol disease peculiar to women, and he found that for the year 1900 there were 19 such cases admitted into this big hospital, and in the year 1920 only 1. He then took all diseases due to alcoholism in that hospital per 1,000 of the male patients. In the year 1900 there were 5 per 1,000, in 1905 5.5 per 1,000, in 1910 4 per 1,000, and in 1915 2 per 1,000; in 1920 it was under 1 per 1,000. There was, in short, the most striking testimony that the consumer of alcohol was becoming much more circumspect, that there was a greater regard for its quality and the times of its consumption; he believed himself that the more critical attitude, the appreciation of what it would do, of the beneficent influence it would have if taken in moderation at proper times, would grow and penetrate through all classes of the community. He fully agreed nevertheless that up to the age of 18 alcohol was seldom or never required in health, and that the exhilarating and useful effects seen in the adult were rapidly followed in youth by irritating and narcotic effects. Therefore the distinction should be made between youth and age. After all, to limit alcohol in adolescence was doing no more than was done in many other aspects of social life. It was insisted that youth should be educated; youth is protected from sexual aggressions, and it was protected in factories. It seemed therefore only logical that youth should be protected from alcohol, and with the caveat that the bill did not carry with it any condemnation of alcohol as such he supported its provisions. The bill was read a second time.

Therapeutic Substances Bill.—On behalf of the Government the Earl of Onslow introduced, on July 19th, a bill "to provide for the regulation of the manufacture, sale, and importation of vaccines, sera, and other therapeutic substances."

Smoke Abatement Bill.—This bill, introduced by the Earl of Onslow in the Upper House on July 19th and now printed, would substitute £50 for £5 as the maximum penalty for a smoke nuisance, and would enlarge and strengthen the law generally for dealing with these matters.

Small-pox.

Mr. Flanagan asked whether the Minister of Health would consider the advisability of supplying Government calf lymph to all private qualified medical practitioners who applied for it, as the material they now have to use might not be up to the recognized Government standard. Mr. Chamberlain said this matter had been considered from time to time, but he doubted whether it was practicable to take action in the direction indicated.

Replying to Mr. Bennett on July 18th Mr. Chamberlain explained that the arrangements governing the appointment of small-pox consultants had been made solely with a view to securing promptly an accurate diagnosis in suspected cases of small-pox. In ordinary circumstances, if the doctor in attendance upon a patient and the local medical officer of health were doubtful whether the case was one of small-pox, arrangements were made, if possible, for one of the medical officers of the Ministry of Health who had special experience in the diagnosis of that disease, to see the patient in consultation with the practitioner and the medical officer of health. The recent outbreak of small-pox had rendered it necessary that some further assistance should be available for the diagnosis of doubtful cases. He had therefore secured the services of twelve medical men residing in different parts of the country, each of whom had special knowledge and experience of small-pox, to visit suspected cases when assistance was sought from his department and the services of medical officers of the Ministry were not immediately available. The sole object of these visits was to assist in diagnosis, and the medical men who had been appointed endeavoured in each case to arrange to see the patient in consultation with the medical attendant and the local medical officer of health.

On the request of Mr. Lunn, Mr. Chamberlain gave, on July 23rd, the following particulars of the annual mortality from small-pox per million living at three group ages under 15:

	0-5.	5-10.	10-15.
1861-70	638	145	56
1871-80	518	285	138
1881-90	80	33	26
1891-1900...	29	10	3
1901-10	22	7	6
1911-20	0.57	0.32	0.11

In answer to Mr. Rhys Davies, Mr. Chamberlain said there had been three deaths amongst small-pox patients at the Brockworth Isolation Hospital. The first was an unvaccinated man, aged 58, who died five days after admission as a result of cerebral haemorrhage and delirium tremens; he was suffering from a mild attack of small-pox. The second was an unvaccinated child, 6 weeks old, who died seven days after admission to hospital. The third was an unvaccinated child, 10 months old, whose death twelve days after admission to hospital was due to small-pox complicated by enteritis and heart failure.

Ministry of Pensions.

Permanent awards of pensions have now been made in approximately 33,500 cases of disease and 120,500 cases of wounds and injuries. It is the practice to consider every case with a view to a final award not later than four years after the first award of pension, and only those found to be unsuitable for a final award are still subject to revision. The number of pensioners is something under 800,000. In March, 1923, the number receiving awards of 50 per cent. or over was 160,800, and these awards were broadly as follows: Eye disabilities, 6,600; injury to limbs (including amputations), 58,000; other wounds and injuries, 22,800; ear disabilities, 2,800; tuberculosis, 30,300; other diseases, 40,300.

The number of half-time medical officers engaged in the work of medical examination and certification for the Pensions Ministry is 1,627, but a large number of them are employed as examining medical officers at clinics. The estimated cost of clinics under the control of the Ministry for the present financial year is £.93,000.

There are now only six instead of seven principal medical officers at the headquarters of the Pensions Ministry, it having been found possible to amalgamate two sections of the work and to terminate the appointment of one of the officers. The duties of five of these officers and of nine of the twenty-one deputy commissioners at headquarters, though in general of an administrative character, were such as could be carried out only by medical men, including as they did the provision of treatment, control of medical staff, organization of medical boards, provision and inspection of hospital accommodation and equipment, and many other duties calling for specialized medical knowledge. The other principal medical officer and the remaining twelve deputy commissioners at headquarters were not employed on administrative work, but were advising medically upon cases presenting special difficulty.

Mr. Pielou asked, on July 24th, whether instructions had been issued to ex-service Deputy Commissioners of Medical Services terminating their temporary services at the end of September; and that non-service doctors were being retained. Captain Craig replied that it had been found necessary to give notice of termination of employment to 36 out of the 88 Deputy Commissioners of Medical Services employed on a six-months' contract. Of those now under notice 30 were ex-service officers and 6 not. There would then remain only 4 non-service Deputy Commissioners employed on a six-months' contract, and these medical officers were being retained in the interests of the pensioners because of their special experience and qualifications.

Mr. R. Morrison asked, on July 19th, for what reason the Ministry of Pensions refused to grant treatment allowances on the certificate of a man's panel doctor that the man was unable to work. Major Tryon said that treatment allowances were payable only when a medical officer of the Ministry was satisfied that the nature of an approved course of treatment was such as prevented a man from providing for his own support and that of his family. Full consideration was always given to any opinion expressed by the panel doctor on the requirements of any treatment approved. Certificates given by Pensions Ministry institutions and clinics recommending home treatment with allowances are not referred to a deputy commissioner of medical services in the ordinary way, but where the examination had been conducted by an outstation medical officer, his recommendation was referred to a deputy commissoner, who never disturbed a recommendation of allowances without personally seeing the man concerned unless the examining medical officer agreed, on reconsideration of the case, that allowances were not admissible.

On a question by Mr. Robert Jones, on July 19th, Major Tryon said that the Deputy Commissioner of Medical Services (Tuberculosis), Wales Region, was attached to the south-western region. The Minister had no definite knowledge whether this gentleman was acquainted with the Welsh language, but as he was performing his duties satisfactorily it might be assumed he had no difficulty in understanding and making himself understood by Welsh pensioners. During the year ended November, 1922, the Deputy Commissioner of Medical Services (Dental) for Wales examined personally 494 individual cases where dental treatment was provided; a considerable proportion had to be referred back for further treatment or adjustment. There were about sixty dentists on the pensions panel in Wales.

Major Tryon states that the final award of life pensions which have been granted up to date for each class of disease are as follows: Dysentery 67, enteric 19, malaria 293, trench fever 34, rheumatism 2,466, pulmonary tuberculosis 623, tuberculosis not pulmonary 265, affections of respiratory system 4,954, organic disease of heart 1,577, functional disease of heart 1,070, nephritis 553, gastric ulcer 146, appendicitis 59, other diseases of alimentary system 326, hernia 328, neurasthenia 2,234, epilepsy 333, tabes dorsalis 99, other organic nervous diseases 516, insanity 284, diseases of eye resulting in complete blindness 83, other diseases of eye 3,761, diseases of ear 3,743, debility 1,013, diabetes 22, flat foot 195, frost bite 907, gas poisoning 341, miscellaneous 5,078, diseases of veins 761, diseases of joints 1,136, and arterio-sclerosis 109. Total 33,445.

At present 2,976 men are undergoing treatment and training in convalescent centres. There was a waiting list of about 380, of whom 46 had been waiting more than two months; it was expected to provide for them within a fortnight. Any course of treatment necessary was provided for waiting cases.

In answer to Mr. Ede, on July 12th, Major Tryon said that the records of admissions to and discharges from ambulances, hospitals, or clearing stations during the war had now been sorted and indexed in one register. The work was begun by the War Office and completed by the statistical division of the Pensions Department as part of its regular duties.

During the past fifteen months about 2,800 claims for pension on account of tuberculosis have been accepted by the Pensions Ministry.

Infant Mortality.—Mr. Chamberlain said, in answer to Mr. A. V. Alexander, on July 9th, that as regards England and Wales no figures as to the deaths of illegitimate children of 1 to 2 years and 2 to 3 years of age were available prior to 1919. From this date the statistics were as under:

Year.	Births.		Deaths under 1 Year.		Deaths, 1 to 2 Years.		Deaths, 1 to 3 Years.	
	Total.	Illegitimate.	Total.	Illegitimate.	Total.	Illegitimate.	Total.	Illegitimate.
1919	692,438	41,876	61,715	7,237	14,124	1,138	7,658	469
1920	957,782	44,917	76,552	7,017	14,741	1,162	6,100	364
1921	848,814	38,618	70,250	6,115	15,636	1,041	4,994	336
1922	780,124	34,138	60,121	4,736	18,948	1,064	8,678	453

Trade Advertisements on Insurance Medical Certificates.—Mr. Chamberlain, on July 18th, said that he did not think that any of National Health Insurance forms that bore advertisements were now being sent out from the Stationery Office. It was possible that Insurance Committees still had some stock on hand, but new forms which did not include the advertisements were now being printed by the Stationery Office. Captain Wallace asked, on July 23rd, when the contract for the Maypole butter advertisement on the back of the medical certificates under the National Health Insurance Act would expire; and whether the Minister of Health would give an assurance that it would not be renewed. Mr. Chamberlain said that the contract for the advertisement on the back of Form Med. 40B related to a print of 20,000 copies of the form. A further supply of the form which had now been ordered from the Stationery Office would be printed without an advertisement.

Milk Feeding Experiments.—Mr. Hurd asked, on July 18th, whether the Minister of Health could state in general terms the results of the milk-feeding experiments among Birmingham Council school children, showing the physiological value of fresh milk as an article of diet and particularly the effect on children suffering from malnutrition of the addition to their dietary of a pint of fresh milk daily; and whether he would publish a report on the experiments to encourage co-operative movements of the same kind among other educational, agricultural, and health authorities. Mr. Chamberlain said it would not be possible in an answer to a question to state the results of the experiments even in general terms. The question of publishing a report was one for the authority responsible for the investigations. The Ministry of Health was conducting investigations in conjunction with the Medical Research Council into the nutritive properties of milk in the feeding of children and the question of issuing a report on these investigations would considered.

Institutional Treatment for Tuberculosis.—Lord E. Percy said, on July 12th, in reply to Mr. T. Thomson, that the Ministry of Health approved generally of the arrangements made by the London County Council for the assessment of contributions payable by tuberculous persons towards the cost of institutional treatment provided by the Council. The statutes under which institutional treatment was provided in London for persons suffering from other infectious diseases did not authorize the recovery of any part of the cost of the treatment from the patient.

Infant Welfare in Cumberland.—Mr. Gavan Duffy, on July 12th, again by question asked the Ministry of Health to press upon the Cumberland Maternity and Child Welfare Committee the urgency of appointing qualified midwives to serve in the districts of Cleator, Cleatormoor, and Frizington. According to the county medical officer of health, the infant mortality in the urban district area of Cumberland last year was 116 per 1,000 as compared with 101 for Scotland, a rate which had been described as murderous. Lord E. Percy replied he was anxious to put the matter right, but the responsibility rested primarily with the local authority.

The Lunacy Act.—In answer to Mr. T. Griffiths, on July 12th, Mr. Chamberlain said the result of the inquiry made by the Board of Control showed that in only a very few institutions had the requirement of Section 8 of the Lunacy Act not been fully adhered to. The reference was as to informing patients in private asylums as to their rights of appeal. The Minister added that the Board had warned the authorities concerned and had received assurances that the Statute requirements would be fully observed.

Royal Army Medical Corps.—Mr. Becker asked, on July 24th, whether the Secretary for War would recommend that young medical men should be invited to serve in the Army Medical Service three, five, or seven years, with a gratuity at the end of the term, so as to maintain a steady flow of young men into the service. Lieut.-Colonel Guinness replied that it was already open to army medical officers to retire with gratuity after eight and a half years' service. He did not think that the shortening of this period was desirable or administratively practicable, having regard, for instance, to the requirements of the army in India.

House of Commons Ventilation.—A departure from reliance upon a scientific system of ventilation has lately been made in the House of Commons by opening some of the windows. This, on July 18th, gave rise to a variety of questions addressed to the First Commissioner of Works. Sir William Davidson inquired whether members were aware that for the first time they were breathing fresh air free from dead streptococci, and suggested that the windows on the other side of the Chamber should be open during divisions. Another member, Mr. Hardie, asked the Minister whether the pressure upon the outlets under the seats could be increased and whether the air inlet could be taken above the present terrace level. Sir John Baird said that he must await the result of experiments during the recess prior to forecasting any changes. Sir C. Kinloch-Cooke suggested that the Minister should visit the Stock Exchange and adopt the same principle at Westminster. Later Mr. Morrison called attention to a very strong odour of turpentine. The Speaker said that the First Commissioner would look into the matter.

Answers in Brief.

The number of convicted debtor and surety prisoners certified insane in prison during the last four years was 432. None of these persons died while still in prison. The Home Office had no information how many of them died before they were discharged from asylums. During the same four years 28 prisoners committed suicide in prison.

Lord Eustace Percy informed Dr. Chapple, on July 19th, that up to July 14th the number of applications received for registration under the Nurses' Registration Act was 40,436. After this date the Council had no power to accept applications by existing nurses.

Mr. Neville Chamberlain, in reply to Sir R. Newman, on July 23rd, gave the following figures of the death rate per million living from pernicious anaemia during the last three years: 1920, males 55, females 62; 1921, males 55, females 74; 1922, males 61, females 74. As regards ex-service men pensioned for injuries or disabilities, 152 out of a total of 60,000 deaths were due to pernicious anaemia.

Scotland.

GRADUATION CEREMONY AT THE UNIVERSITY OF EDINBURGH.

AT the summer graduation ceremony of the University of Edinburgh on July 20th the Principal, Sir Alfred Ewing, conferred the degree of M.D. upon fifteen graduates and those of M.B., Ch.B., on 203 graduands (see page 162).

After the capping Sir Harold Stiles, Professor of Clinical Surgery in the University, delivered an address to the new graduates. After welcoming them into the university he appealed to them to uphold the honour and maintain the reputation of their renowned Alma Mater, and quoted the words of a distinguished divine who said, "Accept your profession as a vocation of God. Greater than all its dignities are its duties, higher than all its honours are its responsibilities." He advised them to devote some of their leisure to the reading of medical history and medical biography, which would foster the spirit of endeavour and emulation, and to give Garrison's *History of Medicine* a foremost place on their shelves. Bacon had said, "Reading maketh a full man, conference a ready man, and writing an exact man." The best way to become a ready man was, he said, to join a medical society (may we suggest the British Medical Association?), and the best way to become an exact man was to cultivate the habit of careful and accurate observation, keeping records of cases.

Need of a Large Maternity Hospital.

He then passed on to make a direct appeal to the graduates and the public of Edinburgh. It was deplorable that the university should have to send its students, some to Dublin and others to Paris, for clinical instruction in obstetrics. The citizens of Edinburgh had recognized Sir James Simpson's great services to humanity by building a maternity hospital as a memorial to him during his lifetime, but the memorial was no longer worthy of the man. A great effort ought to be made to raise funds for building and equipping a maternity hospital worthy of the great tradition of Edinburgh. He quoted from a graduation address at Yale University by Professor W. W. Keen, of Philadelphia, who had said that medical instruction was given far below cost. "If," he said, "the community wants the best doctors with the best possible education the facilities for obtaining such an education must be provided for them by the community. It can never be done through the fees of the students."

Alumni Associations.

In discussing the matter with American friends he had pointed out the difficulty of raising sufficient funds to build a new maternity hospital, and the reply was—"Well, if the community can't or won't help you, why don't you get your Alumni Association to take the matter up?" But there was no alumni association in Edinburgh, and Sir Harold Stiles went on to give some idea of the important part played by such associations in contributing to the welfare and finances of American universities. The Harvard Medical Alumni Association, he said, was founded in 1890, "to advance the cause of medical education, to promote the interests and increase the usefulness of the Harvard Medical School, and to promote acquaintance and good-fellowship among the members of the Association." It was due mainly to the influence and solicitations of the founders of the Alumni Association that J. P. Morgan and others were induced to become financial sponsors for the new medical school buildings, which are the pride and joy of Harvard. In 1906 the Association collected funds for the support of two junior teaching assistants, known as the Alumni Assistants, and the number of assistantships so supported has now been increased to five. At the present time the alumni are contributing towards a fund for the endowment of a professorial chair in obstetrics in the Medical School.

Again, a scheme is to be put into effect whereby New York University is to receive income annually by issuing what are called Loyalty Bonds of 50 dollars par value, to be subscribed for by the members of each year's senior class, and to be paid for in five annual instalments of ten dollars. These Loyalty Bonds were admittedly a gift rather than an investment. But they might well be termed a "gilt-edged investment," from which returns will come, not in mere money dividends, but in the turning out of better equipped, finer men and women for the nation, and in the keeping up of a comradeship with these men and women.

At Yale University alumni are invited to contribute annually such sums as they may be able to give to help the university and its work. The alumni fund began in a very small way; in the first year 800 alumni gave £1,000, but by 1917 some 5,000 graduates were contributing, the amount collected each year being upwards of £100,000. Every alumnus now regarded it as his duty to make an annual contribution varying from 5s. to £1,000 according to the means of the individual giver.

Sir Harold Stiles invited graduates of Scottish universities to imitate the example and to cultivate also the clan spirit, which was fostered in America by the residential system and by the fraternity houses. There, graduation day, or as it was called "commencement day," was an occasion for the assembly of graduates to renew friendships and to make themselves acquainted with the progress and the needs of their old university. A beginning might be made in Edinburgh by the medical alumni, as it was in the medical faculty that funds were most needed. He suggested that every graduate in medicine should become a member of the General Council of the University and that the pound paid to become a member should be converted into an annual subscription.

NOTIFICATION OF CHICKEN-POX.

The Scottish Board of Health has issued regulations making chicken-pox compulsorily notifiable in Scotland as from Monday, July 23rd. Several instances in which mild cases of small-pox were confused with infections other than chicken-pox came to the notice of the Board during the epidemic of small-pox in Scotland in 1920-21; in consequence the Board has suggested to local authorities that they should ask medical practitioners to seek the co-operation of the medical officer of health in dealing with any illness that has even a remote resemblance to small-pox. Every medical practitioner will be supplied through the local authority with a copy of the regulations.

England and Wales.

KING'S COLLEGE HOSPITAL.

A FESTIVAL dinner in aid of King's College Hospital, London, was held at the Savoy Hotel on July 17th. The President, H.R.H. the Duke of Connaught, took the chair and was supported by a very distinguished company, including the Ministers representing six foreign States, the High Commissioner of Australia, the Agents-General for Western Australia and Tasmania, and the Bishop of Southwark, Chaplain of the Hospital. In proposing the toast of the evening—"Prosperity to King's College Hospital"—the Duke of Connaught remarked that the hospital since its removal ten years ago to Denmark Hill had come to serve a very poor and deserving population of a million and a half people in South London. Lord Hambleden's gift of twelve and a half acres of ground made it possible for the institution to rebuild in a district where it was greatly needed. King's College Hospital was proud to remember that when the war broke out it immediately offered its accommodation to the military authorities, and during the war period 31,000 soldiers passed through it, as well as 11,000 civilians. His Royal Highness, whose speech showed complete familiarity with the work and needs of the hospital, asked all present to assist in obtaining financial support in order to extinguish the debt of some £73,000. He concluded by expressing the hope that the voluntary hospital system would weather the storms of to-day. The toast was responded to by Viscount Hambleden, Chairman of the Hospital, who said that experience had shown the wisdom of moving the hospital to its present site. The blessings of a great hospital were now available

almost at the doors of those who formerly had to travel miles in search of relief in sickness or accident. Some of the wards which had been closed from lack of funds were now being occupied by a class of patients who paid for the cost of their maintenance; other patients contributed according to their means. Nevertheless, although there was already accommodation for 400 beds, only 240 could be occupied at the present time, because the hospital had not enough income to maintain a larger number. The health of the Chairman was proposed in very warm terms by Dr. Ernest Barker, Principal of King's College, and the Duke of Connaught in his brief reply was able to announce that the appeal that evening had produced £6,000 towards the hospital funds.

Correspondence.

THE DIFFERENTIAL DIAGNOSIS OF SMALL-POX AND CHICKEN-POX.

SIR,—Dr. Wanklyn, in his note upon this subject (July 21st, p. 106), gives four main essential points for the differentiation of small-pox and chicken-pox. They are briefly—(1) distribution of rash, (2) degree of prostration, (3) depth of the lesions in the skin, (4) rate and manner of maturation of lesions. In regard to No. 2, "Degree of prostration," if Dr. Wanklyn could have added the experience recently afforded in Gloucestershire of "mild small-pox" to the wide experience which he reminds us he has had in the London area, he would almost certainly have shortened the four points to three, which only goes to prove that even when narrowed down to only four points it is still necessary to have an open mind, and that even in regard to all of these four points the statement can only be a general one which is more applicable to the formerly described type of small-pox than to the type now being experienced. The degree of prostration at any stage in many cases of mild small-pox stands at a cipher, and it cannot be less. I have watched contacts by close daily observation through the whole incubation period and early days of the eruption, without any prostration whatever being either complained of or discoverable, and at the same time have been seeing cases of quite typical chicken-pox where the prostration was marked. It is the difficulty at present at Gloucester to persuade people that their children have small-pox because there is no illness, and one of the doctors practising there told me last week that he had assured mothers that their children were not ill enough for the case to be chicken-pox, when they were being removed to hospital as suffering from small-pox.

Further, in regard to the other points mentioned by Dr. Wanklyn, numbers of cases have been seen that were undoubtedly small-pox, but in which all the signs were so trivial that not one of the four points mentioned above would apply. These were cases occurring in families some members of which had definite signs, whilst others occurring simultaneously had perhaps ten papules or less, sufficiently diagnostic when seen in connexion with the other cases, but which alone could not have been diagnosed by any manner of means.

All this, however, is not to say that Dr. Wanklyn's points, except the prostration, are not the chief points of diagnosis of small-pox, even when it is "mild small-pox." —I am, etc.,

J. H. GARRETT,
M.O.H. Cheltenham.

July 21st.

SIR,—The importance and value of diagnostic signs in varicella cannot be over-estimated at any time, and never so much as now when chicken-pox and small-pox coexist. Many so-called distinguishing characteristics are quoted in textbooks, but all of these may fail, and leave one in perplexity. Others are more reliable, such as (*a*) the absence of lumbar pain, (*b*) the presence of one or more elliptical or oval vesicles, (*c*) the continued fever after the appearance of the eruption, (*d*) the fact that the vesicles collapse on being punctured in one place only, showing them to be unilocular.

But there are two signs which are pathognomonic, and, remarkable to say, seldom if ever referred to in textbooks, and which ought to have the first place assigned to them among differential diagnostic signs:

(1) The early vesiculation and crusting of the papules, which may occur in so short a period as thirty-six hours.

(2) The contemporaneous presence of papules, vesicles, and crusts on various parts of the body.

These two signs are invariably seen in varicella, and never observed in variola.—I am, etc.,

ALEX. THEODORE BRAND, M.D., C.M.

Driffield, July 22nd.

TREATMENT OF GONOCOCCAL INFECTION BY DIATHERMY.

SIR,—The article by Drs. Cumberbatch and Robinson in the JOURNAL of July 14th (p. 54) upon the treatment of gonorrhoeal rheumatism by diathermy is of great interest. The successful results of local attack upon the focus in the urethra and cervix are most encouraging, and the publication of their work in ampler form will be eagerly awaited. They seem, however, to look upon the matter from rather too narrow a view-point. Wilde has for many years maintained that the best treatment for chronic rheumatic affection is the raising of the body tissues a few degrees by hot packs or similar methods: if persisted in this line of treatment cures and not merely alleviates the condition. His views have not met with the recognition which they deserve: those who have adopted his line of treatment are convinced of its efficacy and it is very gratifying to find that the writers of this paper are able to lend support to his theory.—I am, etc.,

C. E. SUNDELL.

London, W., July 16th.

SIR,—I have read with great interest the valuable paper by Drs. E. P. Cumberbatch and C. A. Robinson published in the BRITISH MEDICAL JOURNAL (July 14th, p. 54) on the treatment of gonococcal infection by diathermy; it is specially interesting owing to the fact that cases of gonorrhoea both in men and women have been under treatment by diathermy for the past two years at the Derbyshire Royal Infirmary. The treatment has been carried out by Mr. A. K. Maclachlan, surgeon in charge of the Venereal Diseases Department, and myself. We can confirm the successful results obtained by Dr. Cumberbatch and his colleague.

The effect of diathermy on gonorrhoeal arthritis is immediately beneficial, and permanently beneficial. Treatment at the original seat of disease does undoubtedly cure gonorrhoea. I have already written on the diathermy technique adopted, and as soon as Mr. Maclachlan has completed his record of the cases a full statement will be published.

I think there is a distinct advantage for the electro-therapeutist to carry out these investigations in collaboration with one who has special knowledge of gonorrhoea, as the gonococcus is elusive, disappearing in smears for a considerable time, to turn up again when least expected. It would be a precarious decision for an electro-therapeutist to give a patient who has suffered from gonorrhoea a clean bill of health and permission to marry.—I am, etc.,

A. E. MILNER.

Derby, July 15th.

BLOOD SUGAR ESTIMATIONS BY GENERAL PRACTITIONERS.

SIR,—I agree with Dr. Alex. J. W. Calder (July 14th, p. 85) that the tendency of some general practitioners to relegate new methods of diagnosis and treatment to specialists is regrettable. Undoubtedly some labour, time, and perseverance is required to master these new methods; but surely the general practitioner is as capable of taking pains to master a new technique as is his brother in the hospital ward or in the laboratory. The latter also is generally just as busy an individual as the general practitioner, so lack of time is hardly a valid excuse. Perhaps it is lack of fundamental knowledge that prevents the general practitioner from undertaking this work, but many general practitioners take additional qualifications such as D.P.H., etc., which require considerable knowledge of

bacteriological methods and a proficient technique in chemical procedures. So that apart altogether from the question of undergraduate training, there must be a large number of general practitioners with the necessary grounding in the methods.

I suggest that it is lack of adequate financial return for increased skill in technique that hinders the general practitioner. In an ordinary middle-class practice the patient at the present day is unable to meet fees additional to the usual charges for consultations and visits. As regards the insured person, little or no provision is made for payment in respect of additional services such as blood sugar estimations, and absolutely no encouragement given to perform such additional services.

Perhaps as we are medical men, we should do all this in a spirit of altruism. New methods, however, mean new apparatus, and perhaps little alterations here and there in the consulting room—in fact, more financial outlay. In the present state of affairs as regards the general practitioner he who increases his capital outlay is, perhaps, a bold man. —I am, etc.,

W. HERBERT BUTCHER, M.A., M.D.

London, S.W., July 17th.

ETHER *VERSUS* CHLOROFORM.

SIR,—I am an old Edinburgh medical student, and in the summer of 1888 I was chloroform clerk in the Royal Infirmary for six months. How we used to waste the chloroform! but I do not remember a single death in the five years I was there.

Our procedure was as follows: We folded a white towel, and along its upper edge poured on the chloroform. The lower edge was held under the patient's chin, our hands pressing firmly on the angles of lower jaws and well forward, watching carefully the patient's appearance and breathing, and admitting plenty of air.

Now I have come to modify my views. During the war I did the work of our senior medical officer in a large Midland town in order to release him for service in France. During the two years and a half I performed about 250 operations for tonsils, adenoids, and minor operations. My favourite anaesthetic was a mixture of three parts pure ether and one part chloroform, and only once had I to resort to artificial respiration and pituitrin. In that case all went well for a time, and I was just about to remove the right tonsil when suddenly the patient stopped breathing; the pupils were widely dilated and the patient's appearance was like death. My assistant at once began artificial respiration and I injected pituitrin.

Allow me to say how much I enjoy reading my BRITISH MEDICAL JOURNAL. It seems to me to be much more interesting than it was twenty-five years ago. I only wish other general practitioners would give of their valuable experience.—I am, etc.,

Andover, Hants, July 8th. GEO. A. WOLFENDALE.

SIR,—From the discussion on anaesthetics, lately taking place in your columns, it would appear that chloroform is the better anaesthetic; securing "quietness and relaxation," requiring but little anaesthetic, and producing no bronchial irritation and little sickness. Ether appears, statistically, the safer, and, in motoring terms, the more "fool proof."

The question now practically resolves itself into this: Is ether so much more satisfactory than chloroform that it should replace it?

On June 28th an inquest was held on the cause of death of two patients. They had died through the nurse having administered an overdose of atropine prior to the administration of ether. Chloroform requires no atropine. About the same period the patient was anaesthetized with ether in a leading London hospital by a skilled anaesthetist. Vomiting occurred, the anaesthetic was pushed, respiration was obstructed and stopped, tracheotomy and artificial respiration were performed, and the patient died of pulmonary complication two days after, consequent on the administration of the anaesthetic. Some years ago my wife was given ether in London prior to a mastoid operation. She vomited for a week after, admittedly on account of the anaesthetic, and grave fears were entertained for her life, from that cause alone. I recall a series of letters by the late Mr. Clement Lucas, then surgeon at Guy's Hospital, on the danger of pneumonia after ether administration. In my letter of June 23rd I wrote: "Ether lets off the anaesthetist, but is often inconsiderate to the patient, and I doubt, if after-effects could be taken into account and tabulated, whether ether would not present the darker picture." The illustrations I have given justify, I think, that statement. Why should our patients be made so sick, why injected with morphine and atropine, why handed over to unskilled persons to anaesthetize?

If chloroform be pure, administered on a Skinner's mask, held at first six inches from the face and only gradually approached; if occasionally a few drops of ether be also sprinkled on; if morphine be never given, so that the pupil be free to react and be conscientiously watched, while the palpebral reflex is kept just absent, I doubt if misadventures with chloroform would occur more often than fatal complications with ether. If that be the case, why totally discard the better anaesthetic for the second best? We may have to do it because of the administrators of anaesthetics. The marvel is not that chloroform kills, but that it does not do it oftener. That is, I believe, why ether is popular abroad. I have seen a patient suffocated abroad, and held down while struggling for air till relaxation was produced, the mask being held tight down too.

Dr. Herbert Tilley says that the two mishaps with his patients occurred when two well known experts administered the chloroform. Mishaps occur with the sharp scalpels of surgeons, which blunt ones would have avoided. Why not use blunt ones? Because, though they escape the mishaps they bruise the tissues, cause after-troubles not less tragic though less spectacular, and embarrass the surgeon.

Chloroform, too, is a sharp-edged knife, but, personally, I have found it in every way a more convenient and controllable anaesthetic than ether, requiring no adjuvant, inhaled by the patient in far smaller quantity and far less cold, and causing less irritation, sickness, and after-trouble. Why should I and others discard chloroform for ether, which has more drawbacks and possibly equal dangers? Let the specialist teach the student how to administer chloroform safely and properly, and ether reasonably. —I am, etc.,

Knowle, Topsham, Devon, July 7th. D. W. SAMWAYS.

VACCINATION PROPAGANDA.

SIR,—The Research Defence Society has issued an essay on vaccination by Mrs. Scharlieb, and a short leaflet for general distribution. The secretary will gladly send copies of the essay and of the leaflet to all applicants. Address, 11, Chandos Street, Cavendish Square, London, W.1.

The Society has already distributed a very large quantity of the leaflets, and will gladly supply any amount of them. —I am, etc.,

London, W., July 22nd. STEPHEN PAGET, F.R.C.S.

Obituary.

HARRY SHORE, M.D., D.P.H.,

Medical Officer of Health, Walsall.

WE regret to record the death, in tragic circumstances, at the age of 52, of Dr. Harry Shore, medical officer of health for Walsall for the past fourteen years. Dr. Shore met by chance the superintendent health visitor in his department, who was riding a motor bicycle. Dr. Shore was much interested in motors, having been one of the first persons in the district to drive a motor car, and suggested trying the motor bicycle. Unfortunately, the end of his coat caught in the driving wheel and he fell to the ground, fracturing the base of his skull. Dr. Shore was educated at Queen's College, Birmingham, and Durham University, and at the latter he graduated M.B., B.S. in 1892, and M.D. in 1895, and took the D.P.H. in 1894. He was formerly in general practice in Walsall, and held the appointment of honorary surgeon to the Walsall Hospital for some seven

years, before being appointed medical officer of health, school medical officer, and police surgeon. He was a zealous and conscientious medical officer, a man of strong convictions and fearless in expressing them. He is survived by his widow and one son.

DR. GEORGE EDWARD MILES died at Sydney on June 11th. He was the son of the late G. D. Miles, of Jamaica, and was educated at Guy's Hospital, taking the M.R.C.S. in 1875 and the L.R.C.P.Lond. in 1884. Subsequently he went to Australia, where he filled the posts of medical officer of Callan Park Hospital, Sydney, and Medical Superintendent of the Lunacy Department of New South Wales. He took a temporary commission as lieutenant-colonel in the R.A.M.C. from October 27th, 1915, and served till 1919, receiving the C.B.E. on June 3rd, 1919.

Medico-Legal.

BIRTH CONTROL LIBEL ACTION.

STOPES *v.* SUTHERLAND AND OTHERS.

THE Court of Appeal on July 20th, 1923, allowed the appeal of Dr. Marie Stopes from the judgement of the Lord Chief Justice on the findings of the special jury in the action brought by her against Dr. Halliday Gibson Sutherland, the author, and Messrs. Harding and More, Ltd., the publishers, of an alleged libel. The trial was reported in our issue of March 10th, 1923, page 445.

The Lord Chief Justice had left four questions to the jury: (1) Were the words defamatory of the plaintiff? (2) Were they true in substance and in fact? (3) Were they fair comment? (4) Damages, if any; and, upon the jury finding that the words were true in fact but that the comment was not fair, assessing damages at £100, the Lord Chief Justice considered the answers of the jury to amount, in law, to a verdict for the defendants.

Lord Justice Bankes, in delivering the judgement of the majority, said that the questions left to the jury were not happily framed. Without considerable explanation of what they were intended to cover they were likely to lead—as in fact, they had—to considerable difficulty. There were, no doubt, cases in which the line could be clearly drawn between what were statements of fact and what were expressions of opinion. If there had been no summing up he should have thought that, having regard to counsel's speeches and the form of questions, the jury must have understood that all parties invited them first of all to deal with the libel on the footing that it consisted of statements of fact and to give their opinion whether those statements were true or not, and that they might ignore the remaining questions if they answered this question in the affirmative. But the jury's answers indicated that they did not so understand the position. He was unable to agree with the view taken by the Lord Chief Justice that this was a case in which the rule applied—that the plea of fair comment did not arise if the plea of justification was made good. He thought the Lord Chief Justice invited the jury in his summing up to consider whether the words complained of were statements of fact or expressions of opinion, and therefore the jury were entitled to read the questions as inviting a separate opinion on matters of fact and on expressions of opinion, or partly one and partly the other. As to some of the words, the Lord Chief Justice had clearly intimated his view that they were expressions of opinion. It was impossible to ignore any of the answers of the jury and to deal with the case as the Lord Chief Justice had done by entering judgement for the defendants because the jury had entered a verdict in their favour on what the Lord Chief Justice had described as the main issue. If there was a subordinate issue, and the jury decided in the plaintiff's favour on that issue, she was entitled to the benefit of that decision. In spite of the speeches of counsel, and the challenge taken up by the respondents to treat the issue of justification as a decisive issue, in spite also of the form of questions, Lord Justice Bankes considered that the Lord Chief Justice was right in directing the jury as he did as to the separate issues, and that there was evidence on which the jury were entitled, if they thought fit, to treat parts of the libel as expressions of opinion on facts truly stated which were not fair comment, and to which, therefore, a plea of justification of the facts was no answer. The only courses open to the Court were either to order a new trial, or to direct judgement for the appellant on the issue of fair comment. The judgement for the defendants must be set aside and entered for the plaintiff for £100.

Lord Justice Scrutton concurred, but Lord Justice Younger delivered a dissenting judgement. On what he considered to be the narrowest permissible view of the answer of the jury to the second question, the defendants had justified to such an extent as was required and were entitled to hold their judgement.

THE IMPERIAL COLLEGE OF HYGIENE.

IN April, 1922, the Rockefeller Foundation agreed to purchase a site at the corner of Gower Street and Keppel Street, London, from the Shakespeare Memorial Trust for the erection of the Imperial College of Hygiene for £52,000, but in July, 1922, the solicitor for the Ministry of Health, who was acting on behalf of the purchasers, requested the vendor to apply to the Charity Commissioners for their consent to the sale. The vendor, the Earl of Lytton, is the sole surviving trustee of the Shakespeare Memorial Trust, and, upon an originating summons, he asked the Court for a declaration that he could sell without the consent of the Charity Commissioners.

It was in the autumn of 1904 that the late Mr. Richard Badger and Sir Israel Gollancz formed a committee for the organization of a movement for a Shakespeare memorial in London, and early in 1905 a general committee was constituted. In May, 1908, the National Theatre Committee and the Shakespeare Memorial Committee resolved to unite in forwarding a scheme for a Shakespeare Memorial Theatre. It was estimated that £500,000 would be required, and on May 8th, 1908, the late Sir Carl Meyer, without any stipulations as to the particular objects on which it should be expended, paid £70,000 to trustees, of whom the Earl of Lytton is the sole survivor, to hold in trust for the committee. The first annual subscription to the fund was received nine days after Sir Carl Meyer's donation, and down to the end of 1922 £10,321 16s. 7d. was received by way of subscriptions. Upon the outbreak of war the site was granted rent free to the Y.M.C.A. for the use of soldiers, and after the war it was rented by the Y.M.C.A. for the accommodation of Indian students. The increased cost of building and general scarcity of money since the war caused the Memorial Committee to abandon the theatre scheme, and to empower the sole surviving trustee to enter into an agreement to sell the site to the Rockefeller Foundation.

The questions for the Court to decide were: (1) Was the Shakespeare Memorial Trust a charity? and if so (2) was it a "mixed" charity? in which case the Charity Commissioners' consent to the sale would not be necessary.

Mr. Justice Lawrence has now held that it was a good charitable trust on educational grounds, as the main object was an educational scheme to raise the tone of the drama and produce plays for the benefit of the community. The solution of the second question depended upon whether at the date when the £70,000 was given the charity was maintained partly by voluntary subscriptions and partly by income from endowments. This would make it a "mixed" charity from its inception. The learned judge, however, held that it was not, and that therefore the Charity Commissioners' consent to the sale of the land was necessary. Because a charity shortly after receiving £70,000 became a "mixed" charity, or because the committee had intended all along that it should be supported by voluntary subscriptions, did not exempt it from the jurisdiction of the Charity Commissioners.

Universities and Colleges.

UNIVERSITY OF LONDON.

THE following grants have been made out of the Thomas Smythe Hughes Medical Research Fund for the year 1923–24:

1. To Dr. Evelyn E. Hewer, D.Sc., and Mrs. Lucas Keene, M.B., B.S., jointly, £100 for an investigation of the human foetus, with a view to establishing the normal development of organs, their normal microscopical structure at all ages of development, the scope of "physiological" variations, and the effects of various abnormal factors.
2. To Dr. H. M. Woodcock, D.Sc., £50 for an investigation of blood digestion by tissue cells along histological lines; especially in connexion with the increased development of the mammary gland during pregnancy and the formation of milk.

Mr. Raymond Johnson, O.B.E., F.R.C.S., has been re-elected chairman of the committee of the medical members of the Senate.

The following candidates have been approved at the examinations indicated:

M.D.—BRANCH I (*Medicine*): A. G. Duncan, R. Ellis, D. M. Lloyd-Jones, Olive Rendel.
BRANCH III (*Psychological Medicine*): P. C. P. Cloake (University Medal).
BRANCH IV (*Midwifery and Diseases of Women*): T. G. D. Bonar, Mariamne O. Ramsay, P. J. Veale (University Medal).
BRANCH V (*State Medicine*): E. W. C. Thomas.
BRANCH VI (*Tropical Medicine*): G. Covell.
M.S.—BRANCH I (*Surgery*): M. W. B. Bulman, Esther Rickards.

UNIVERSITY OF EDINBURGH.

Ordinary Degrees.

THE summer degree ceremony in medicine of the University of Edinburgh took place on July 20th, when the Principal, Sir Alfred Ewing, conferred the following degrees and diplomas:

M.D.—A. F. Adamson, R. A. Chambers, J. D. M. Claassens, ‡J. H. Clarke, W. H. Dickinson, J. F. Duncan, ‡B. A. G. A. Edelston, ‡J. H. Fairweather, T. J. Howell, †H. A. Macmillan, *R. Miller, †G. I. Moriarty, ‡J. P. Watt, *H. W. Wilson.

* Awarded gold medal for thesis. † Highly commended for thesis.
‡ Commended for thesis.

M.B., CH.B.—J. N. Adam, S. F. Allison, D. G. Anderson, D. T. Anderson, E. W. Anderson, H. P. Anderson, D. Band, J. S. Banks, C. Bateman, Elizabeth A. Baxendine, R. S. Begbie, M. J. Bett, A. Beveridge, Helen Blacklay, Anna L. Blair, C. E. M. Blumer, Harriette G. Bogle, J. P. S. Bow, G. P. F. Bowers, Margaret G. Bowie, E. F. Boyd, W. Boyd, R. D. Bradshaw, D. Brims, N. M'D. Brown, W. N. Brown, W. J. Burns, T. D. Burt, A. J. M. Butter, Eva T. Cairns, Flora H. M. Calder, D. Cameron, J. D. S. Cameron, A. Campbell, L. F. Capell, *R. Carmichael, H. Carter, W. H. Carter, Aileen M. Chester, Dorothy A. Christie, A. L. Clark, A. G. Cole, H. H. Condie, J. Cooper, A. Cowan, J. M. Cowan, Margot A. Craig, J. Crooks, J. F. Cunningham, J. D. Dear, R. Dick, A. Dickson, W. R. Duff, G. A. Dunlop, H. H. Dunlop, C. W. Durward, †Caroline A. Elliott, Helen B. Ewart, Marjory H. Ewing, W. R. D. Fairbairn, J. S. Faulds, A. W. Fawcett, A. W. Gardiner, Elizabeth M. B. Garrigan, F. W. Gavin, J. Gillies, M. A. Graham-Yooll, R. Grant, ‡J. Gray, A. M. M. Grierson, D. Grieve, I. M. D. Grieve, B. T. Halliwell, R. W. W. Hardie, G. M'N. Hargreaves, C. H. de la Harpe, J. A. Harris,

Edith N. Hartley, W. M. Hetherington, S. L. Hislop, P. C. C. B. Hook, Doris M. Hopps, G. Horne, Agnes M. M. Hunter, Edith I. M. Irvine-Jones, Agnes L. Jenkins, C. D. Kennedy, A. M. Kerr, H. J. R. Kirkpatrick, P. L. Kock, Ena M'L. Laing, J. Lambert, W. T. Lawson, T. K. Lee, R. Levinson, Nora Lister, Elspeth H. R. Livingstone, W. Love, E. B. Low, Phyllis M. H. Lunn, G. A. Macadie, D. I. Macaulay, A. R. MacCallum, A. R. M'Clure, A. D. Macdonald, J. A. Macdonald, A. M'Dowall, W. S. M'Ewan, R. M. Macfarlane, J. S. MacGill, I. H. Maciver, F. B. MacKenzie, A. MacPherson, †J. B. C. Madge, W. F. Mair, D. S. Malone, A. Marly, J. J. B. Martin, G. A. Masson, R. J. Matthews, Margaret G. Maxwell, †Alison J. Maxwell Wood, H. Miller, Ellen A. Morrison, G. H. Morrison, W. Morrison, Janet M. Morton, R. Morton, H. Munro, H. B. Newcombe, Agnes M. Ogilvie, D. C. Osborne, L. C. Palmer-Jones, †J. R. K. Paterson, Susanne J. Paterson, Kate Y. Pearson, A. Penman, G. H. Percival, O. O. Popper, F. N. R. Price, Jean R. Purves, A. L. K. Rankin, J. Reid, R. J. Reid, J. S. Riddle, F. L. Rifkill, R. P. A. Rigg, Hilda C. Roberts, I. M. Robertson, G. M. Ross, A. A. M. Sandilon, P. Schneiderman, W. C. S. B. Sewrey, D. A. M. Shearer, B. Siddons, W. A. Simpson, J. Sinclair, C. Siung, J. M'I. Smellie, A. B. Smith, A. F. Smith, Dorothy F. Smith, Jean L. Smith, S. M'K. Smith, G. Somerville, R. C. Speirs, Alice Steven, D. B. Strachan, †J. Sturrock, T. J. Sumner, H. W. Sutherland, C. J. Swanson, R. E. M. Taunton, L. M. Thompson, Vera Thompson, Elsie Thomson, F. B. Thomson, G. H. Thomson, K. J. Thomson, M. S. Toukby, J. Trotter, T. Tully, Anne M. Turnbull, D. A. Urquhart, E. R. C. Walker, F. M'D. Walker, E. P. Waters, W. N. B. Watson, G. M. Westwood, †A. C. White, I. G. Williams, J. H. Williams, N. B. Williamson, C. R. Wilson, Jeanie Wilson, Mary Wilson, †W. M. Wilson, J. F. S. Wiseman, G. K. Wood, E. D. M. Wright, D. H. D. Young, J. B. Young, J. N. Young.

* Passed with first class honours.
† Passed with second class honours.

D.P.H.—Esther J. Campbell, Mary C. Campbell, Grace Cumming, Gladys H. Dodds, T. Ferguson, Elspeth L. Gilmour, Elizabeth R. Kemp, Catherine A. J. Mitchell, Dorothea M. Norwell, Annie C. Roberts, Jessie W. Strang, Isabella Taylor, Annie E. Webster, Doris S. Williams.

Fellowships and Prizes.

The following Fellowships, scholarships, prizes, etc., were presented:

Thesis Gold Medallists: R. Mailer, M.D., H. W. Wilson, M.D. The Cameron Prize in Practical Therapeutics: J. J. R. Macleod, M.B., F.R.S., Professor of Physiology in the University of Toronto, for important contributions to physiology, especially concerning carbohydrate foods in the treatment of diabetes. The Gunning Victoria Jubilee Prize in Materia Medica: J. H. Crawford, M.D. The Gunning Victoria Jubilee Prize in Forensic Medicine: D. J. A. Kerr, M.B., Ch.B. The Gunning Victoria Jubilee Prize in Obstetrics: D. A. Miller, M.B., Ch.B. The Ettles Scholarship and Leslie Gold Medal: R. Carmichael, M.B., Ch.B. The Allan Fellowship in Clinical Medicine and Clinical Surgery: J. Gray, M.B., Ch.B. The Murchison Memorial Scholarship in Clinical Medicine: J. Gray, M.B., Ch.B. The M'Cosh Graduate's and Medical Bursaries: W. N. B. Watson, M.B., Ch.B. The Beaney Prize in Anatomy and Surgery: Caroline A. Elliott, M.B., Ch.B. The Mouat Scholarship in the Practice of Physic: J. L. N. Dinwiddie, M.A., M.B., Ch.B. The Conan Doyle Prize: G. G. King, M.A.Oxon., M.B., Ch.B. The Annandale Gold Medal in Clinical Surgery: J. M. Cowan, M.B., Ch.B. The Buchanan Scholarship in Gynaecology: I. M. Robertson, M.B., Ch.B. The James Scott Scholarship in Midwifery: F. B. Thomson, M.B., Ch.B. The Scottish Association for Medical Education of Women Prize: Caroline A. Elliott, M.B., Ch.B. The Dorothy Gilfillan Memorial Prize: Harriette G. Bogle, M.B., Ch.B. The Wellcome Medals in the History of Medicine: Gold Medal, J. Aitken; Silver Medal, D. G. S. M'Lachlan. The Wightman Prize in Clinical Medicine: W. J. A. Coldstream. The Cunningham Memorial Medal and Prize in Anatomy: G. Brown. The Whiteside Bruce Bursary: I. G. W. Hill.

Honorary Degrees.

The Senatus Academicus resolved to offer the honorary degree of LL.D. to the following members of the eleventh International Physiological Congress now being held in Edinburgh: Filippo Bottazzi, Professor of Physiology, University of Naples; Willem Einthoven, Professor of Physiology, University of Leiden; William Henry Howell, Professor of Hygiene, University of Baltimore; J. E. Johansson, Professor of Physiology, Caroline Institute, Stockholm; Albrecht Kossel, Professor of Physiology, University of Heidelberg; Hans Horst Meyer, Professor of Pharmacology, University of Vienna; Ivan P. Pavlov, Professor of Physiology, University of Petrograd; Charles Richet, Professor of Physiology, Sorbonne, Paris.

ROYAL COLLEGE OF PHYSICIANS, EDINBURGH.

THE Dr. Jessie Macgregor Prize in Medical Science for the present triennial period has been awarded by the trustees to Miss May Laurie Walker, M.B., Ch.B.Edin., of the Department of Physiology in the University of Edinburgh, for her record of work on the anatomy and physiology of the depressor nerve. The value of the prize is 50 guineas.

SOCIETY OF APOTHECARIES OF LONDON.

THE diploma of the Society was granted to the following candidates entitling them to practise medicine, surgery, and midwifery: W. E. Farnham, A. Gullertein, N. Howard, C. M. John, E. F. Johnson, I. Lipman.

The Services.

TERRITORIAL DECORATION.

THE Territorial Decoration has been conferred upon the following officers of the R.A.M.C., T.A.: Lieut.-Colonel (Brevet Colonel) A. B. Gemmel, C.B.E., ret. (General Hospital); Major A. B. Murray; Major H. M. Fort, and Captain E. P. Minett, ret.

Medical News.

THE University of St. Andrews will celebrate the installation of Mr. Rudyard Kipling as Rector by conferring the honorary degree of LL.D. upon a number of distinguished persons, including Sir John Bland-Sutton, President of the Royal College of Surgeons of England, the Prime Minister, and Mr. Kipling himself.

THE Council on Medical Education and Hospitals of the American Medical Association reports that the number of medical schools in the United States is now 81, a decrease of two from last year due to the closing of two homœopathic medical schools. The number of medical schools at the present time is exactly half the number that existed in 1906, when there were 162. The number of medical students during the present year is estimated to reach a total of 17,700, the largest number enrolled since 1912. In 1919 the total was 13,052, which was the lowest number recorded since 1890, but of this number approximately 90 per cent. possessed higher educational qualifications as compared with only 6.2 per cent. in 1904. The average age of the medical students who graduated in 1922 was 26.8 years.

THE trustees of the fellowships founded as a memorial to the late Sir William Ramsay, F.R.S., Professor of Chemistry at University College, have made their awards for 1923–24. Since the institution of the trust in 1919 twenty-one fellows have been appointed and nine others have so far been nominated this year. Among the appointments is that of a Norwegian fellowship of 5,400 kroner to Mr. Gunnar Weidsmann, to work at Cambridge under Professor Gowland Hopkins. Information received with regard to the present position of earlier fellows shows that most of them are now occupying important posts.

THE Minister of Health has drafted Regulations as to the labelling and composition of dried milk on the lines of the Regulations recently made with regard to condensed milk. Copies can be purchased under the description "Draft of the Public Health (Dried Milk) Regulations, 1923," from H.M. Stationery Office, or through any bookseller (price 2d.). Any representations on the subject should be addressed to the Secretary to the Ministry at an early date. The Regulations are intended to come into operation on January 1st, 1924, and will apply to all dried milk intended for sale for human consumption in England and Wales.

DR. W. CAMPBELL LYONS, who recently resigned the post of medical officer of health to the South Shields Town Council to take up private practice, has been presented by the members of the departmental staff with a handsome mahogany bureau.

PROFESSOR ROGER has been re-elected Dean of the Paris Faculty of Medicine. Professor Pierre Marie will resign his chair in the Faculty on August 1st.

A GIFT of 150,000 dollars by Mr. John D. Rockefeller, jun., is to be distributed among fifteen hospitals in the United States and Canada for the purpose of promoting the use of insulin in the treatment of diabetes. The hospitals will be selected from all parts of the countries.

THE second International Congress of Military Medicine and Pharmacy was recently held in Rome, when the following subjects were discussed: (1) carrying out of evacuations; (2) collaboration of civil and military authorities for the protection of public health; (3) methods of disinfestation and disinfection.

AN All-Russian Congress for combating venereal disease was held at Moscow from June 6th to 9th. The fourteenth Congress of Roentgenologists was recently held at Moscow, under the presidency of Professor Nemenow, Director of the State Institute of Roentgenology, and was attended by representatives from America, Bulgaria, China, Czecho-Slovakia, Holland, Hungary, Italy, Japan, Jugo-Slavia, Norway, Rumania, Spain, Switzerland, and Turkey.

SIR HUMPHRY ROLLESTON, K.C.B., President of the Royal College of Physicians, has accepted an invitation to join the honorary medical board of Lord Mayor Treloar Cripples' Hospital and College.

THE William Gibson Research Scholarship of the Royal Society of Medicine has been awarded to Miss M. Forrester-Brown, M.D.Lond., of Dundee.

THE seventeenth French Congress of Medicine will be held at Bordeaux from September 27th to 29th. The subjects for discussion include: (1) Remote sequelae of malaria, by Professor Le Dantec, Dr. Hesnard, Dr. Marcel Léger, and Dr. Broden, of Brussels; (2) relationship of the sympathetic system and the endocrine glands in pathology, by Professor Pachon and Dr. Perrin; (3) treatment of meningococcal infections, by Professor Dopter and Dr. Boidin.

Letters, Notes, and Answers.

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London;* telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London;* telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Mediocra, Westrand, London;* telephone, 2630, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin;* telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh;* telephone, 4361, Central).

QUERIES AND ANSWERS.

COTTAGE HOSPITALS.

DR. CHARLES H. GREENWOOD (7, Park Street, Ripon) asks for information as to cottage hospitals recently built or provided. If any such institution exists in Yorkshire the committee of the proposed hospital, which is to have two wards of eight or ten beds each, and an *x*-ray room, would like permission to visit it.

INJECTIONS OF ETHER IN WHOOPING-COUGH.

"M.R.C.S." asks for further information with reference to intramuscular injections of ether in whooping-cough, regarding which several references were recently published in the EPITOME (April 21st, 1923, paragraph 333; October 14th, 1922, paragraph 272; November 18th, 1922, paragraph 378). He inquires whether it is Ether Pur. (*B.P.*) which is used, and what, in the case of a girl aged 12 years, should be the dose and at what intervals.

INCOME TAX.

"W. F. W." bought an 8-h.p. B—— in 1913 for £165, the usual price being £197. In 1920 he bought a 12-h.p. A—— for £530 and agreed to sell the B—— for £80, the cost of a similar new car being then £560; in fact, however the B—— was retained and is used privately and, on occasions, for professional purposes also. The inspector refuses to allow more than £165–£80=£85.

*** So long as the B—— remains available for professional use we are not clear that "W. F. W." has any claim to an allowance for the cost of replacing it. If, however, the inspector is prepared to waive that point, the allowance is determinable—on lines as to which official evidence was given before the Royal Commission on the Income Tax—according to the cost of replacement, and not, where that amount is less, according to the original cost of the machine. On this basis we compute the allowance as follows:

Original cost	= £165
Present equiva'ent for replacement purposes—	
1⅓ths of £560	= £470

LETTERS, NOTES, ETC.

VACCINATION PROPAGANDA.

DR. WM. VERNER FURLONG (Dublin) writes: The method suggested by Dr. St. John Croley (July 21st, p. 120) is very good, but when one thinks that the actual disease—itself passing through and killing a number of the inhabitants—has little, if any, effect in converting these antivaccination cranks, the only true remedy is compulsory vaccination. Why should the health and vitality of a people be at the mercy of ignorant faddists who cannot realize that vaccination is a means of adopting Nature's plan of immunity?

COOLIDGE TUBES.

DR. H. FLECKER (Melbourne, Victoria) writes with reference to the behaviour of the Coolidge tubes described by Dr. Robson in the JOURNAL of April 21st (p. 699): Surely this is to be traced to faulty operation of his outfit, particularly faulty rectification, rather than to any inherent faults of the tubes themselves. "I have myself," he continues, "noticed a steady diminution in the lives of the new deep therapy Coolidge tubes, the first four of which last 190 and 130 hours at 5 milliampères, and 80 and 48 hours at 6 milliampères (200,000 volts). This I believe to be due to rectifier defect, and since it has been remedied I look forward to a much longer life with my next tube."

M. SPAHLINGER'S TREATMENT FOR TUBERCULOSIS.

THE *Manchester Guardian* last week published articles to which it gave great prominence detailing a proposal stated to have been made by the Lancashire Insurance Committee for establishing a tuberculosis institute at Eastbourne where insured persons from Lancashire could be treated with serum obtained from M. Spahlinger's laboratory near Geneva. This it was suggested could be done under Section 21 of the National Insurance Act, 1911, which authorizes an approved society or insurance committee "to grant such subscriptions or donations as it may think fit to hospitals, dispensaries, or other charitable institutions." The last term is wide, and has been interpreted to mean institutions of a similar kind to hospitals, or such other institutions as carry on work of the kind dealt with by the Act. A deputation from certain approved societies in Lancashire was in London last week, and after conferring with Lancashire members of Parliament and in their company it had an interview at the Ministry of Health with Sir Walter Kinnear, controller of the Insurance Department, and Sir George Newman, chief medical officer to the Ministry. The deputation, according to the *Manchester Guardian*, came away with the impression that "if certain technical difficulties could be overcome the scheme may receive the approval of the Ministry." We have already fully explained the position of the Ministry in an article published on May 12th, p. 830. The Ministry, through unofficial channels, has intimated to M. Spahlinger that it will be prepared to appoint a committee of recognized medical experts to watch the results of his method of treatment in a number of cases to be selected by a physician nominated by M. Spahlinger. One of the difficulties has been that M. Spahlinger declines to divulge the technique by which the vaccines and serums he makes are prepared, but the Ministry is prepared to waive any objection on this score. We believe that the Ministry's position is exactly what it has been during the last two or three years; that is to say, the Ministry is prepared, as soon as it can obtain some of the material prepared by M. Spahlinger, to have it tried on a number of suitable cases of his own selection, under the supervision of an impartial committee of competent and disinterested physicians. It is considered that the evidence hitherto received is not conclusive, although it is enough to call for further investigation. M. Spahlinger's methods imply nothing new in principle; they are essentially those which have been tried sometimes with and sometimes without success in other bacterial diseases. He seeks (1) to produce active immunity against the tubercle bacillus and its toxins in a patient by the injection of a vaccine, and (2) to make an antiserum which has antitoxic and bacteriolytic properties, and to use this to confer passive immunity on a human being. M. Spahlinger's vaccines are essentially similar to the tuberculins. He has, we understand, four vaccines made from tubercle bacilli, and a complete course of vaccine treatment consists of successive courses of injections of each of these four vaccines. The complete antiserum is made by mixing a large number of antiserums each obtained from a horse which has been subjected to some particular course of injections; the serum of each such horse is called a partial antiserum. It is stated that M. Spahlinger and his family have provided about £80,000 to carry on his work, and the *Manchester Guardian* adds that he has recently received a contribution of £20,000 from an individual in this country. Whether the surplus funds from approved societies can be used to relieve M. Spahlinger's financial embarrassments is a legal question which we do not propose to discuss. It seems to us, as we have said before, that M. Spahlinger's difficulties are of his own making, and that they would disappear were he to accept the very reasonable and simple condition proposed by the Ministry of Health.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 30, 31, 34, 35, and 36 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 32 and 33.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 76.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Six lines and under	0	9	0
Each additional line	0	1	6
Whole single column (three columns to page) ...	7	10	0
Half single column	3	15	0
Half page	10	0	0
Whole page	20	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, W.C.2, not later than the first post on Tuesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.